



An innovative self-assessment Method

EOQ 55th Congress
Budapest, 22nd June 2011

Dipl.-Ing. Efstratios Petrellis

MEN - Our Success Story

Foundation in 1982

- ◆ Privately held by three owners

Sales and support network

- ◆ MEN headquarters, Germany
- ◆ MEN S.A., France
- ◆ MEN Micro Inc., USA
- ◆ Worldwide distribution



Results 2010

- ◆ 34.5 Mio € turnover
- ◆ 40 Mio € expected 2011
- ◆ 220 employees
- ◆ 43% Export
- ◆ >80k boards produced
- ◆ >20k systems shipped





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Our Products – Rugged and Reliable Computers

Rugged for harsh environments

- ◆ -40...+85°C operation temperature
 - ⇒ Conduction & convection cooling
- ◆ Shock, vibration, resonance, drop
- ◆ Humidity, dust, chemical influence
 - ⇒ Conformal coating



Reliable for critical applications

- ◆ For safety-critical applications
- ◆ 24h operation, up to 30 years



Qualified and developed in accordance with norms

- ◆ EN 50155, EN 50129, DO-254 etc
- ◆ Up to SIL 4, DAL-A

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Flight Control System for UAVs

DIEHL

The customer

- ◆ Diehl BGT Defence equipment for surveillance, reconnaissance and **optical collision prevention** systems for airplanes

The application

- ◆ **SKY-Y sensor system** for UAVs for surveillance, warning and training

The electronics

- ◆ CPCI Serial system with 4 CPU cards
 - 3x G20 (control/pre-processing of 3 cameras)
 - 1x G20 (interface maintenance unit)
- ◆ Communication via full Ethernet mesh on backplane
- ◆ G215 multi-function I/O card (FPGA-based)
- ◆ G501 with SSD



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Avionics – Cargo Control for Airbus A400M

RHEINMETALL

The customer

- ◆ Leading European supplier of army technics



The application

- ◆ **Freight load system** for fully automated aerial delivery
- ◆ Contract until 2050

The electronics

- ◆ Custom development of the **Load Master Workstation** electronics
 - ⇒ Based on **triple-redundant D602** with PowerPC 750, AFDX, graphics, I/O
- ◆ Custom development of the panel electronics
- ◆ DO-254 & DO-178 B, DAL-B



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Railways – Signaling Control

SIEMENS

The customer

- ◆ Leader in transportation vehicles, equipment and infrastructure



The application

- ◆ Safety-critical SIMIS track control system for inside and outside train

The electronics

- ◆ Redundant 3U CompactPCI system with F14..F19P Intel (Core 2 Duo) SBCs and F211 Ethernet cards under Windows
- ◆ 5 units with own SBC, separate PSU and custom backplane interconnected via Ethernet
- ◆ Two 1oo2 sub-units for safety and availability
- ◆ One sub-unit for communication and data storage



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Railways – Wireless Service Application

DB

The customer

- ◆ German railway operator with 239,000 employees and a turnover of 30.000 Mio €



The application

- ◆ Service unit for ICE high-speed trains
E.g. **seat reservation**, carriage diagnosis
- ◆ **WLAN and GSM/UMTS connection** of the carriage to the computer center of the DB

The electronics

- ◆ Complete 3U CPCI system with customized backplane and
- ◆ SBC F19P (Core 2 Duo) with 2 Ethernet via M12 and custom heat sink for +85°C
- ◆ Wireless unit F212 (PCIe MiniCard carrier) with diplexer, WLAN and UMTS/GSM



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Railways – Universal Control Equipment ALSTOM

The customer

- ◆ Global player in power generation and rail transport



The application

- ◆ **(Safety-critical) control of all types of train functions**

The electronics

- ◆ Custom PowerPC MPC 855 COM for 6U 220mm Eurofer carrier
 - E.g. **triple redundant for emergency brake**
- ◆ Custom Ethernet switch
 - E.g. with built-in CPU board as coordination for the power cars
- ◆ Custom repeater
- ◆ Fully compliant with EN 50155



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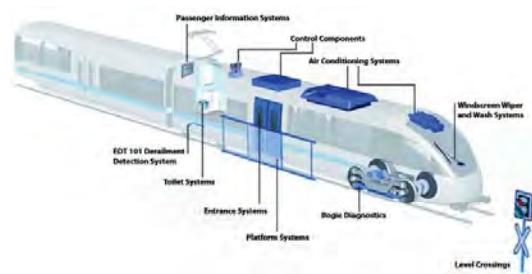
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Railways – Driver Desk Solutions

KNORR BREMSE

The customer

- ◆ Manufacturer of braking and control (e.g. driver assistance) systems



The application

- ◆ **Driver desk information displays**
 - E.g. for monitoring fuel consumption

The electronics

- ◆ SC21 COTS display electronics card
- ◆ Inside customized housing with 7" TFT display and touch
- ◆ Complete device in accordance with EN 50155



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Railways – Locomotive Drive Control



The customer

- ◆ Drive solution for rail vehicles and manufacturer of diesel-hydraulic locomotives, e.g. Maxima



The application

- ◆ TracSys central or **remote control** and **diagnosis system** for all functions of the Maxima

The electronics

- ◆ Complete customized system fully compliant to EN 50155
- ◆ Modular DIN-rail units for flexible configuration
- ◆ Stations connected by CAN bus
- ◆ Self diagnosis of all assembly groups
- ◆ Automated addressing and termination of individual modules



Mining Machines – Control Platform



The customer

- ◆ Global leader for **underground mining machinery** for the extraction of coal and other bedded materials



The application

- ◆ Re-architecture of common control and HMI servers for JOY FACEBOSS control platform

Agriculture Machines – Intelligent Farming

The customer

- ◆ CLAAS is one of the leading and most innovative suppliers of agricultural and harvesting machines



The application

- ◆ CEBIS is a **mobile data terminal** and acquisition system supporting **intelligent farming applications**



The electronics

- ◆ Standard ESMexpress® modules
- ◆ On a CLAAS specific carrier board
- ◆ Integrated in a custom specific designed housing
- ◆ Including display, touch screen, WLAN,...



Commercial Vehicles – Driverless Bus Control

The customer

- ◆ APTS in Holland introduces PHILEAS, a **driverless bus** which is fitted with magnetic markers for electronic lane assistance and precision docking

The application

- ◆ Guidance Computer System (CGS)
- ◆ **Speed and direction control via 4 redundant systems** installed in different places in the bus



The electronics

- ◆ Redundancy with 2-out-of-3 systems
- ◆ **Safety Level SIL-4** with fail-safe CAN redundant communication infrastructure
- ◆ 3U CompactPCI SBC F50C (PowerPC and FPGA)
- ◆ Conduction cooled housing
- ◆ Integrated wide-range PSU
- ◆ -40°C to +70°C and IP65
- ◆ EMC sealed, EN 50155 qualified



Medical – Ventilators for Intensive Care

HAMILTON
MEDICAL

The customer

- ◆ Low-pressure, high-flow gas valves for medical applications, **automation of respiratory support devices**

The application

- ◆ **Control of ventilation devices** with **patient monitoring** for invasive and non-invasive adult, pediatric and infant therapy

The electronics

- ◆ ESM COMs EM1A with MPC5200B and EM10 with MPC5123 under VxWorks
- ◆ Application-specific I/O completely in FPGA
- ◆ Graphics, binary I/O, pulse width measurement, quadrature decoder, frequency counter, Ethernets and UARTs
- ◆ Custom carrier board developed by Hamilton



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Industrial – Move Control of Asimo

HONDA
The Power of Dreams

The customer

- ◆ Known as one of the world's most successful car manufacturers, Honda has also developed Asimo

The application

- ◆ Humanoid robot able to move like a human (Asimo in Japanese means «with legs»)
- ◆ 3 to 4 SBCs per Asimo for **control** of human senses – hearing, speaking, seeing

The electronics

- ◆ 3U CompactPCI SBCs F15 & F17 under Windows XPe
- ◆ Evaluating CompactPCI PlusIO & Serial SBCs F19P & G20
- ◆ Need powerful ULV CPUs for fanless and weight-critical environment



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Technology Leadership

Contribution to standardization bodies

- ◆ ANSI-VITA
- ◆ PICMG
- ◆ ARINC (AFDX)



American National Standards Institute



Development of standards

- ◆ M-Modules™ and PC•MIP®
- ◆ RSE (ESMexpress®)
- ◆ CompactPCI® PlusIO and Serial

Technology Know-How Exchange

- ◆ Cluster Railway Technology Bavaria
- ◆ Cluster Aerospace Bavaria

Cooperation with the Nuremberg University of Applied Sciences

- ◆ E.g. feasibility studies

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Management Systems at MEN



- ◆ DIN EN ISO 9001:2008
- ◆ DIN EN ISO 14001:2005
- ◆ EN 9100 / AS 9100
- ◆ GRESS
(General Requirements for Equipment and System Suppliers)
- ◆ IRIS
(International Railway Industry Standard)
- ◆ EFQM
(European Foundation for Quality Management)
- ◆ MEN management system fulfills the requirements set out by the international and German Road Traffic Regulations

Basic industrial standard

Environmental management

Aerospace standard

AIRBUS additional requirement

Railway standard

Business Excellence Model



MEN is the first German company which is IRIS and EN 9100 and ISO 9001 certified at the same location!

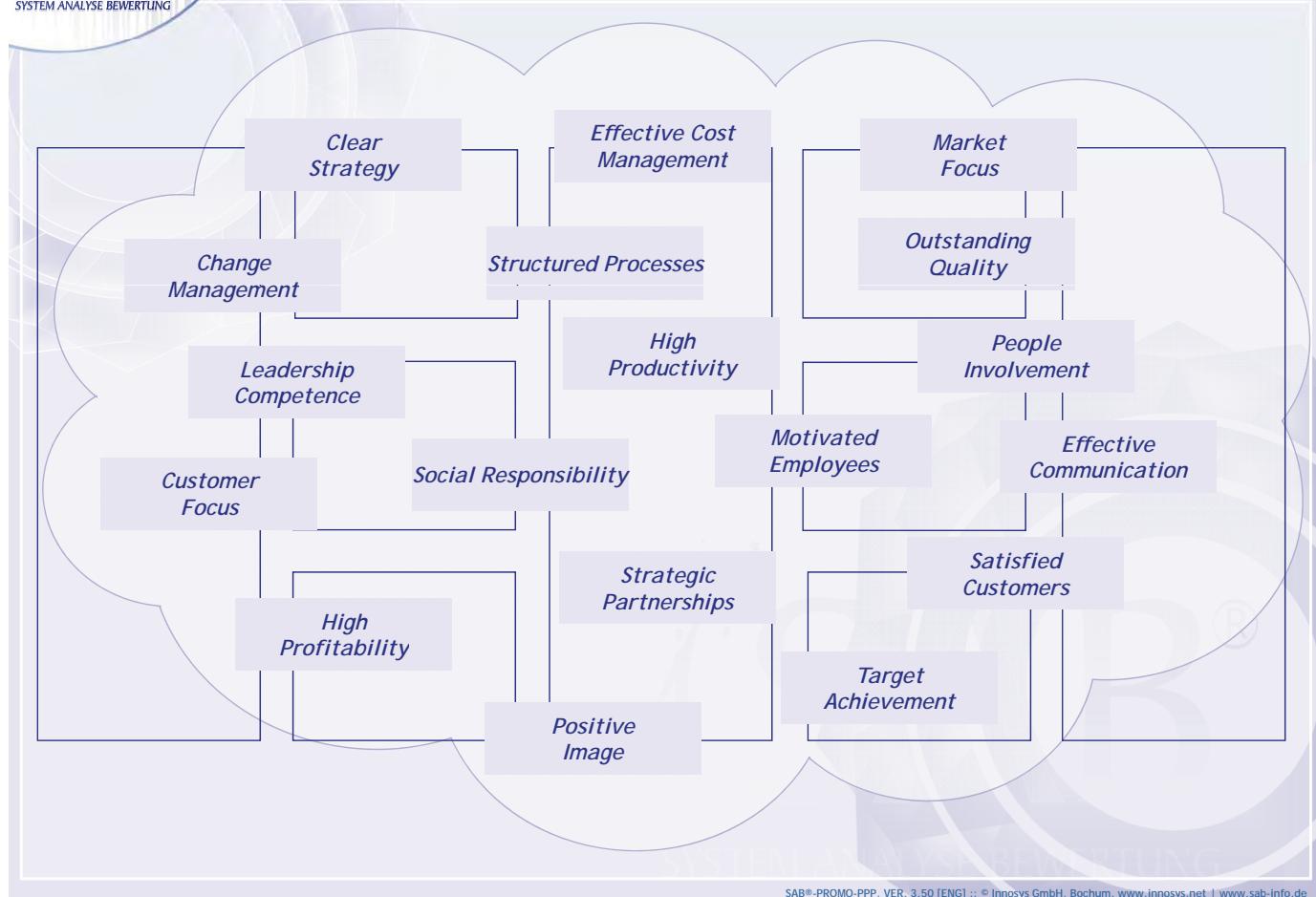
What distinguishes an excellent organisation?

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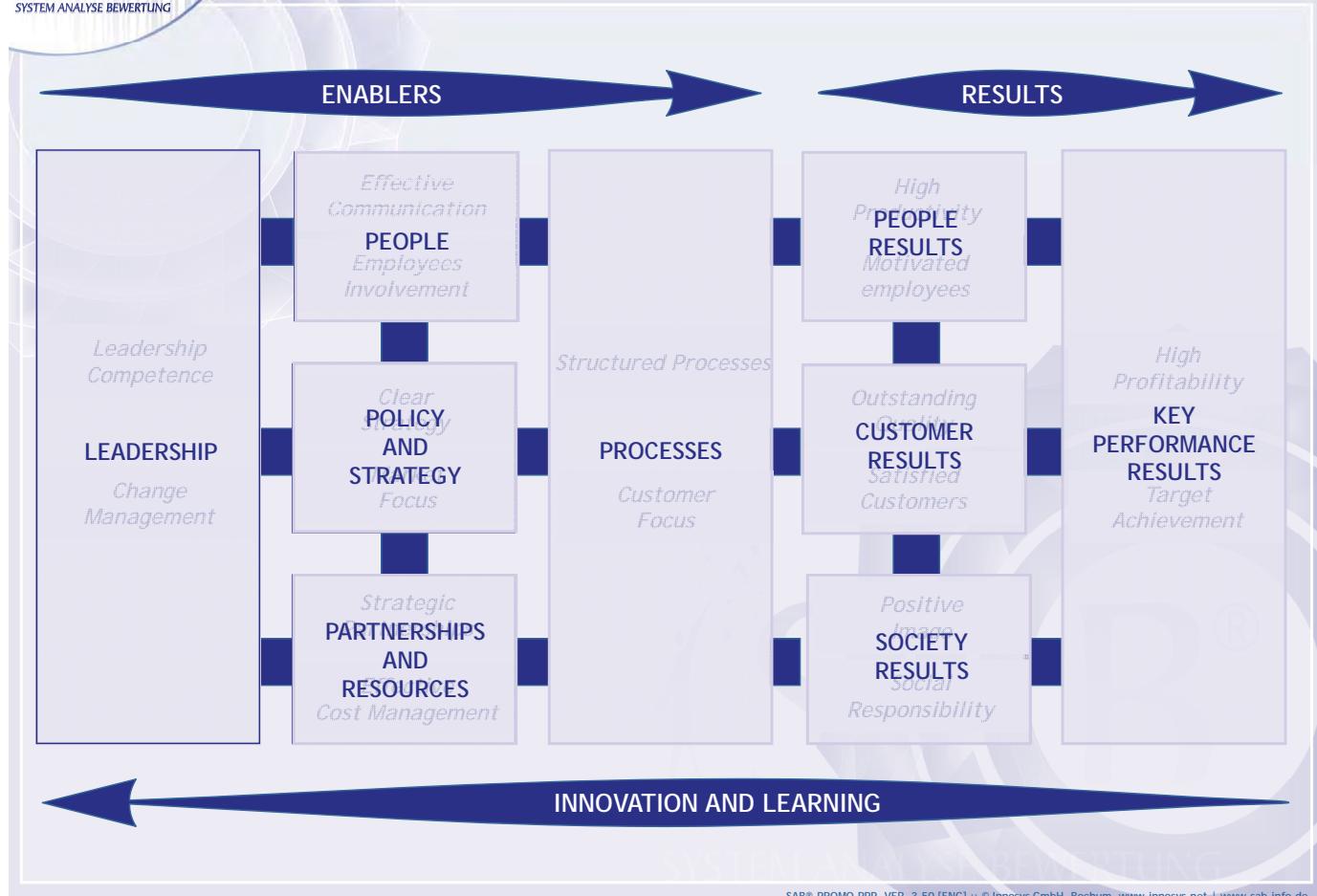
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An effective method for implementing excellence concepts

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Developing an innovative Self-Assessment Method

SIX CORE TARGETS OF SAB®

1 Achieving the Involvement of Top Management

2 Identifying Priorities, Strengths and Opportunities
for Improvement

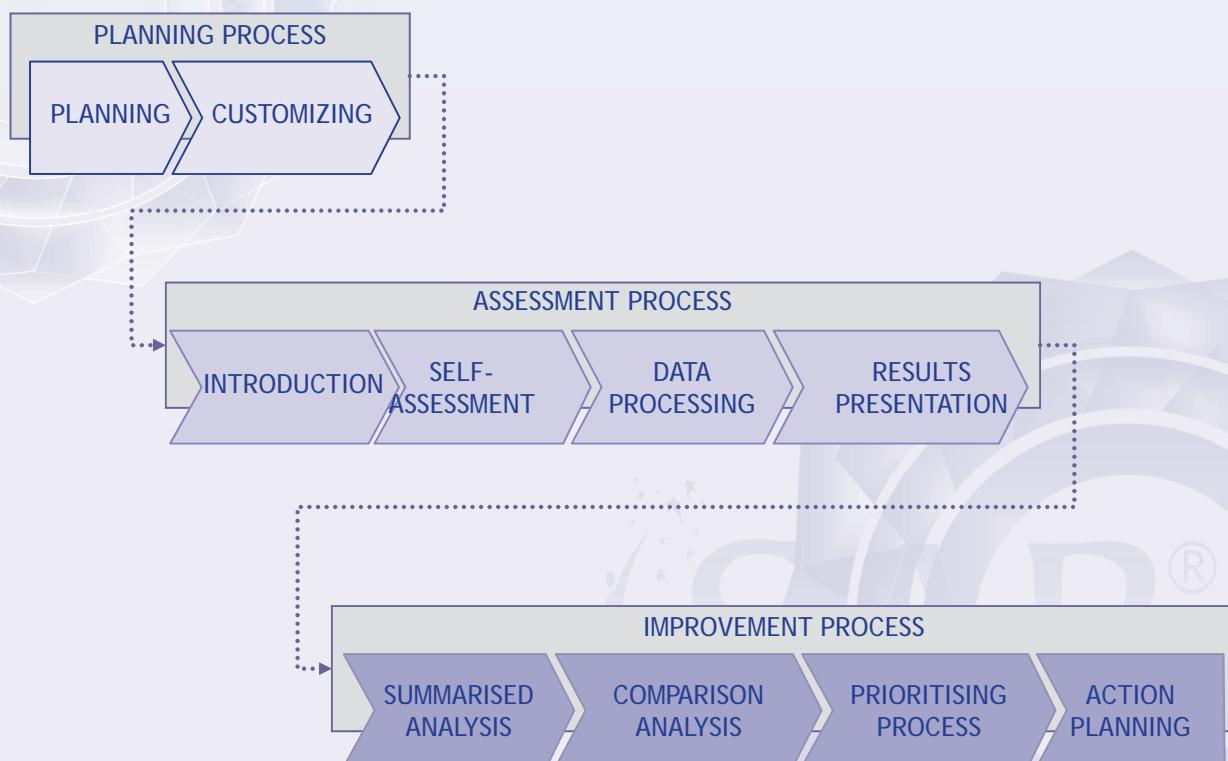
3 Identifying Critical Information and Knowledge Gaps

4 Ensuring a Common Understanding of Goals and Plans

5 Fostering the «Entrepreneurship Spirit»
within the Management Team

6 Enabling Benchmarking Activities and
the Exchange of Best Practices

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IMPORTANCE

1. LEADERSHIP

0 1 2 3 4 5

1. Senior Leaders set and deploy organizational values, short and long-term directions and performance expectations.
2. Senior Leaders include a focus on creating and balancing value for customers and other stakeholders in their performance expectations.
3. Senior Leaders communicate organizational values, directions and expectations through your Leadership System to all employees and to key suppliers and partners.

First you are asked to assess
the Importance of each topic in
regard to the overall success of the organisation.

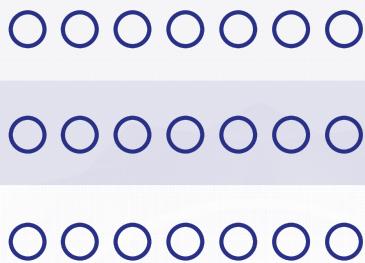


PERFORMANCE

1. LEADERSHIP

x 0 20 40 60 80 100

1. Do Senior Leaders set and deploy organizational values, short and long-term directions and performance expectations?
2. Do Senior Leaders include a focus on creating and balancing value for customers and other stakeholders in their performance expectations?
3. Do Senior Leaders communicate organizational values, directions and expectations through your Leadership System to all employees and to Key suppliers and partners?



You are asked to assess the current Performance of your organisation regarding to Approach and Deployment of Systems/Processes and to achieved Results. A (x)-field can be marked if information on a topic is missing.

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*Scoring Logic
for Enablers
(Criteria 1-5)*

ASSESSMENT AND REVIEW

- Measurement
- Learning
- Improvement

APPROACH

- Sound
- Integrated

DEPLOYMENT

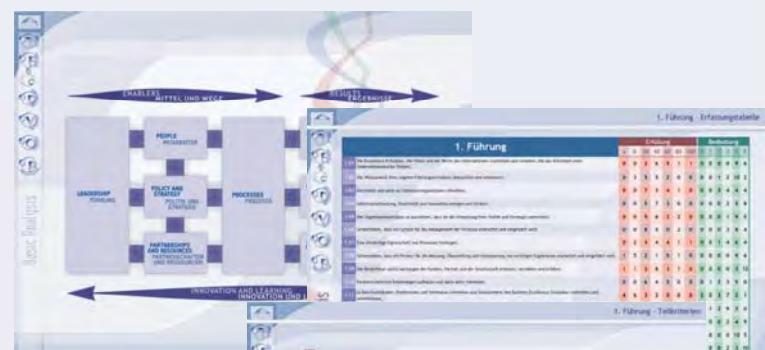
- Implemented
- Systematic

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What results
could you expect?

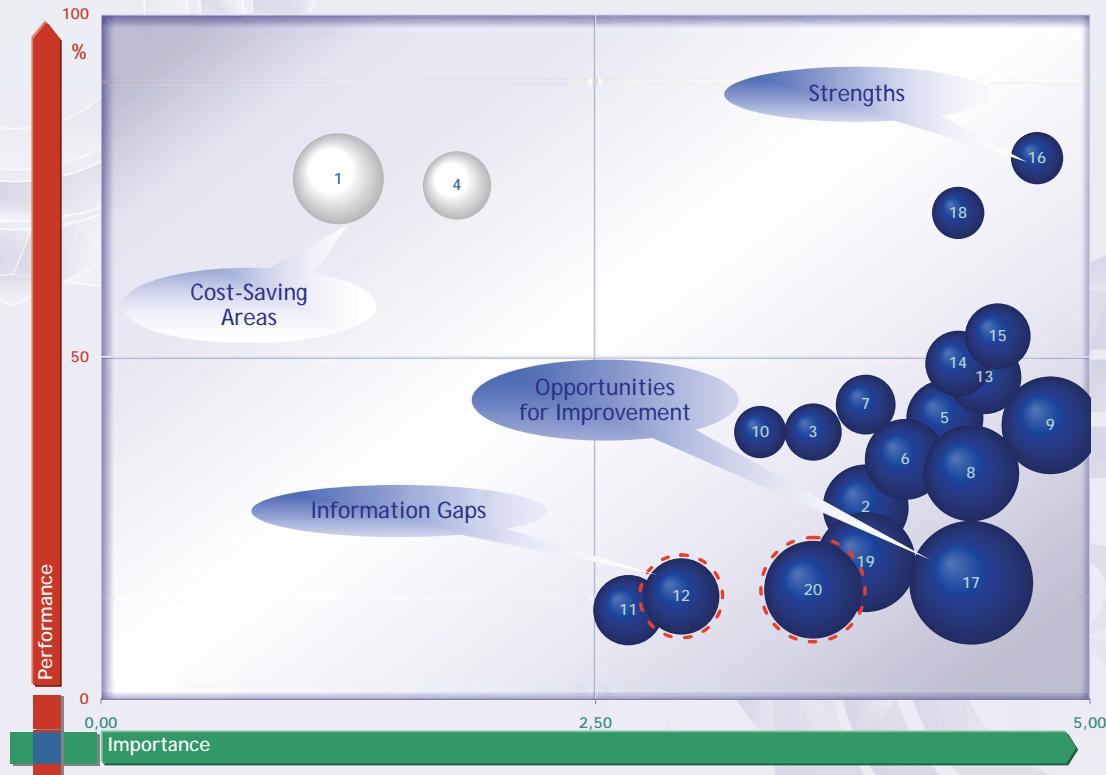


Developing
130 Slides in
the basic analysis
presentation.

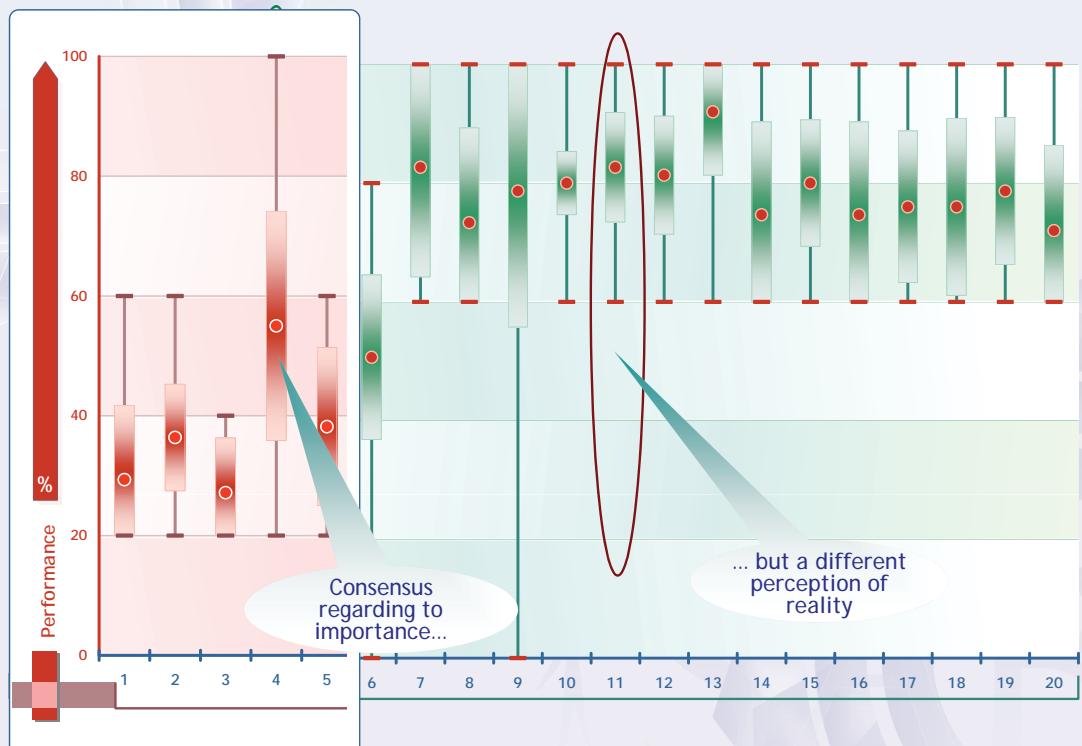


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PORTFOLIO ANALYSIS FOR GETTING DETAILED INFORMATION



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SYSTEM ANALYSE BEWERTUNG

MEN Mikro Elektronik GmbH
Nuremberg, 16.11.2010



Basic Analysis



Summarised Analysis



Prioritising Workshop

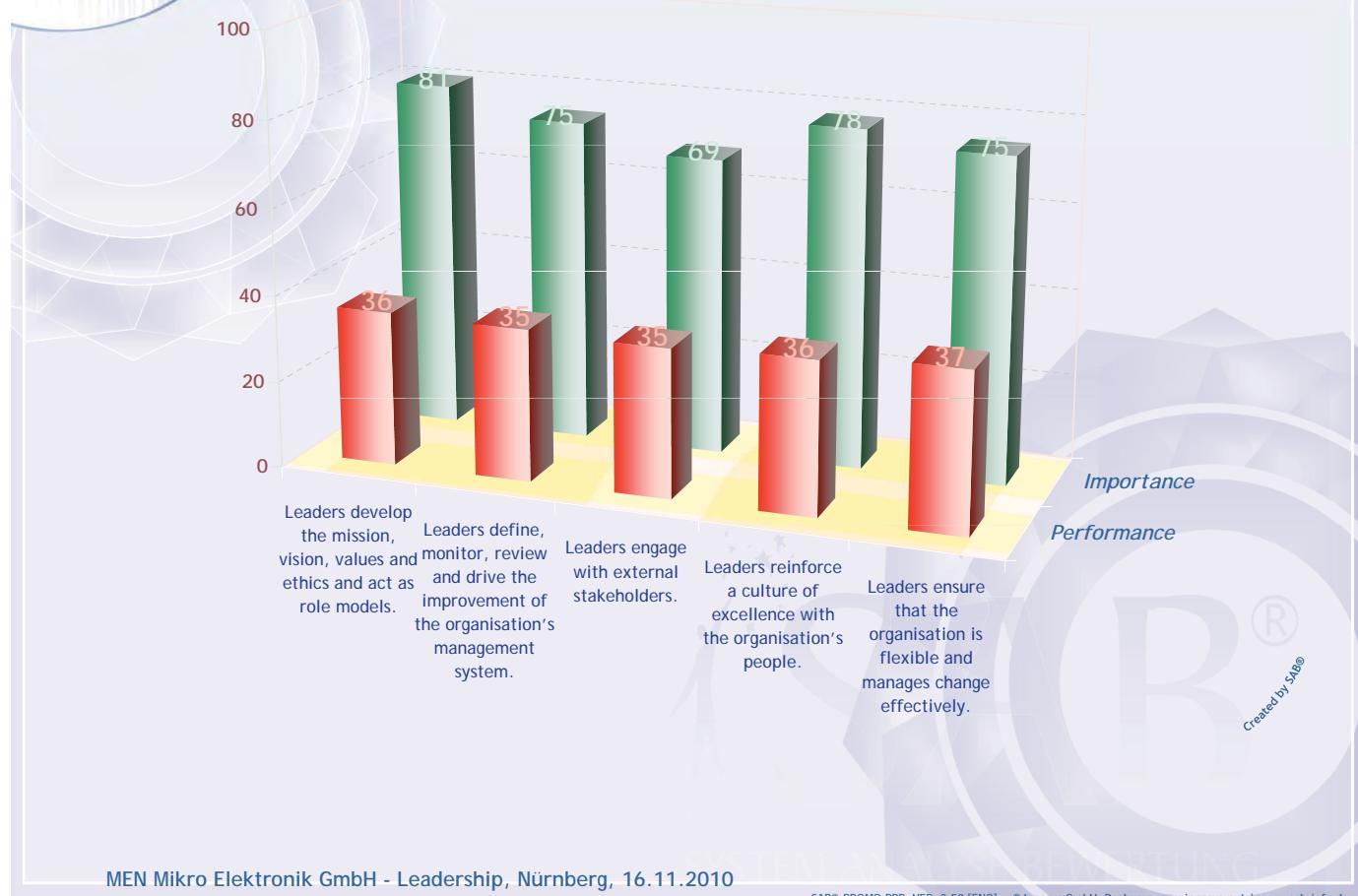


Comparison Analysis



Action Planning

RESULTS



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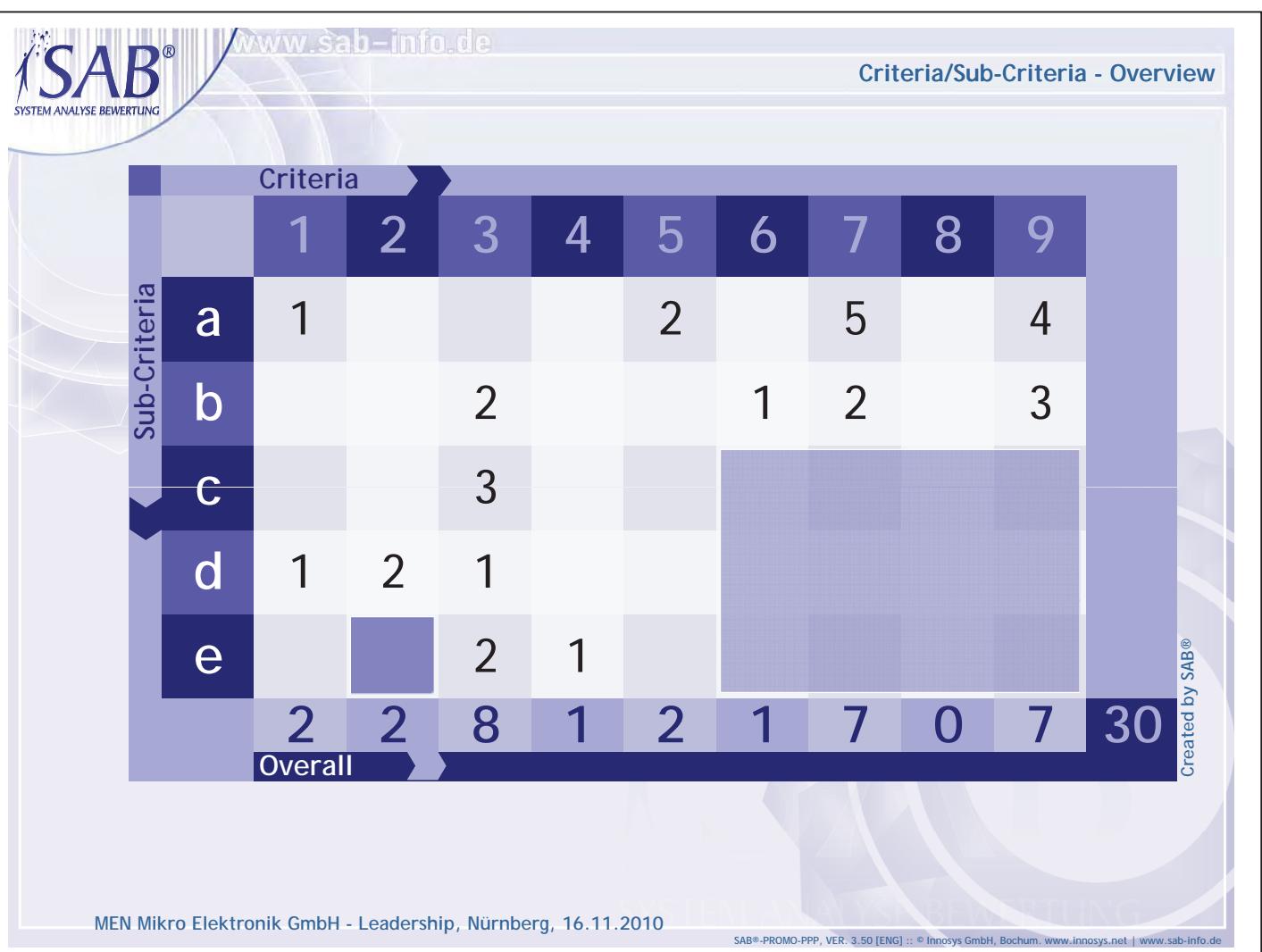
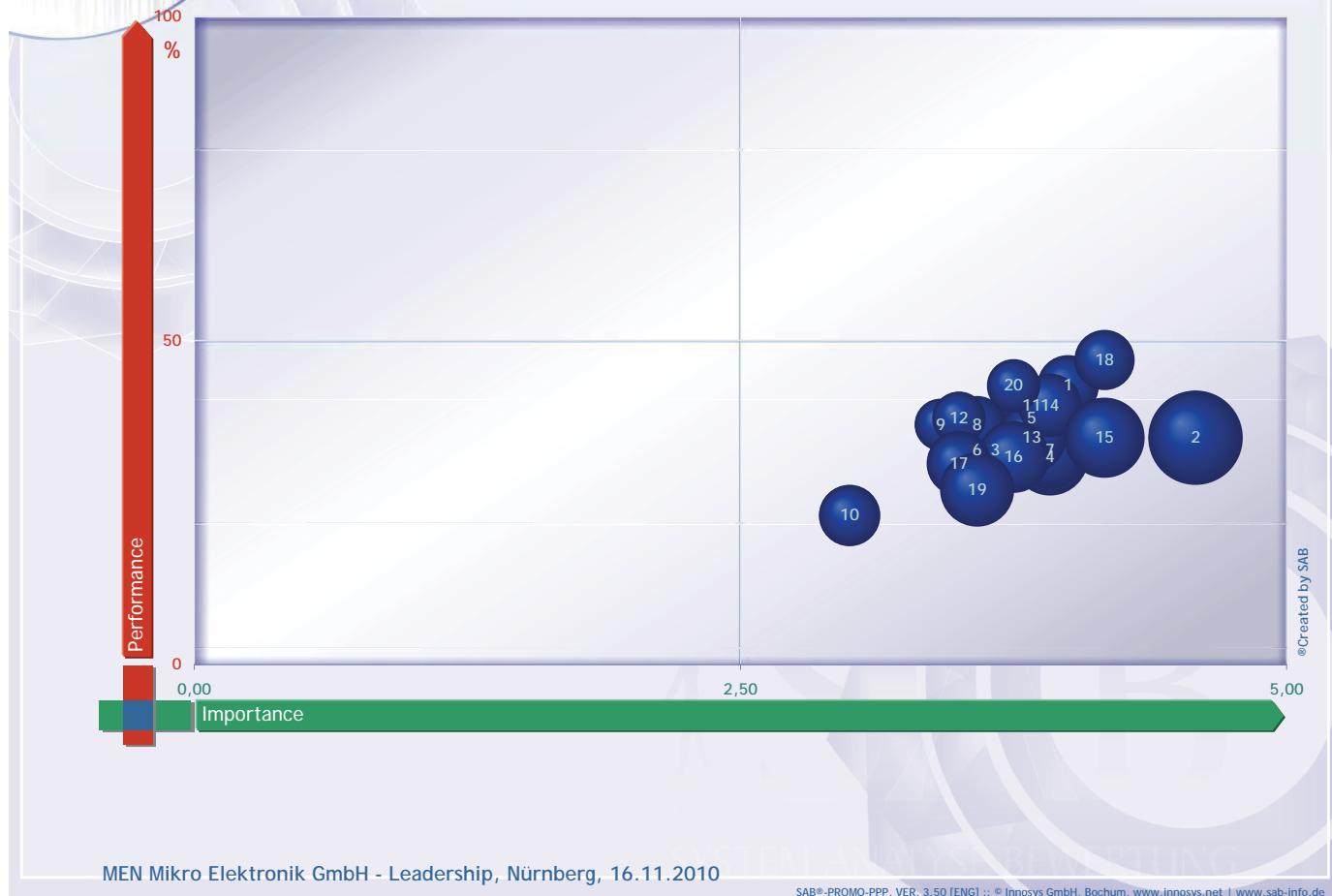
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1. Leadership - Overall Figure



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NR	AREAS FOR IMPROVEMENT			
3-17	Promote a culture of mutual support, recognition and care between individuals and between teams.			
1-02	Set and communicate a clear direction and strategic focus.			
3-06	Ensure training and development plans help people match the skills and future capability needs of the organisation.			
3-08	Appraise and help people improve their performance to improve and maintain their mobility and employability.			
...	...			
1-15	Mitarbeiter diese auch verstehen. Das volle Potential der Mitarbeiter erschließen, damit diese Ihren Beitrag zum eigenen und dem Erfolg der Organisation leisten können.	35	83	48
3-20	Eine Kultur der gegenseitigen Unterstützung, Anerkennung und Fürsorge zwischen einzelnen und zwischen Teams fördern.	35	83	48

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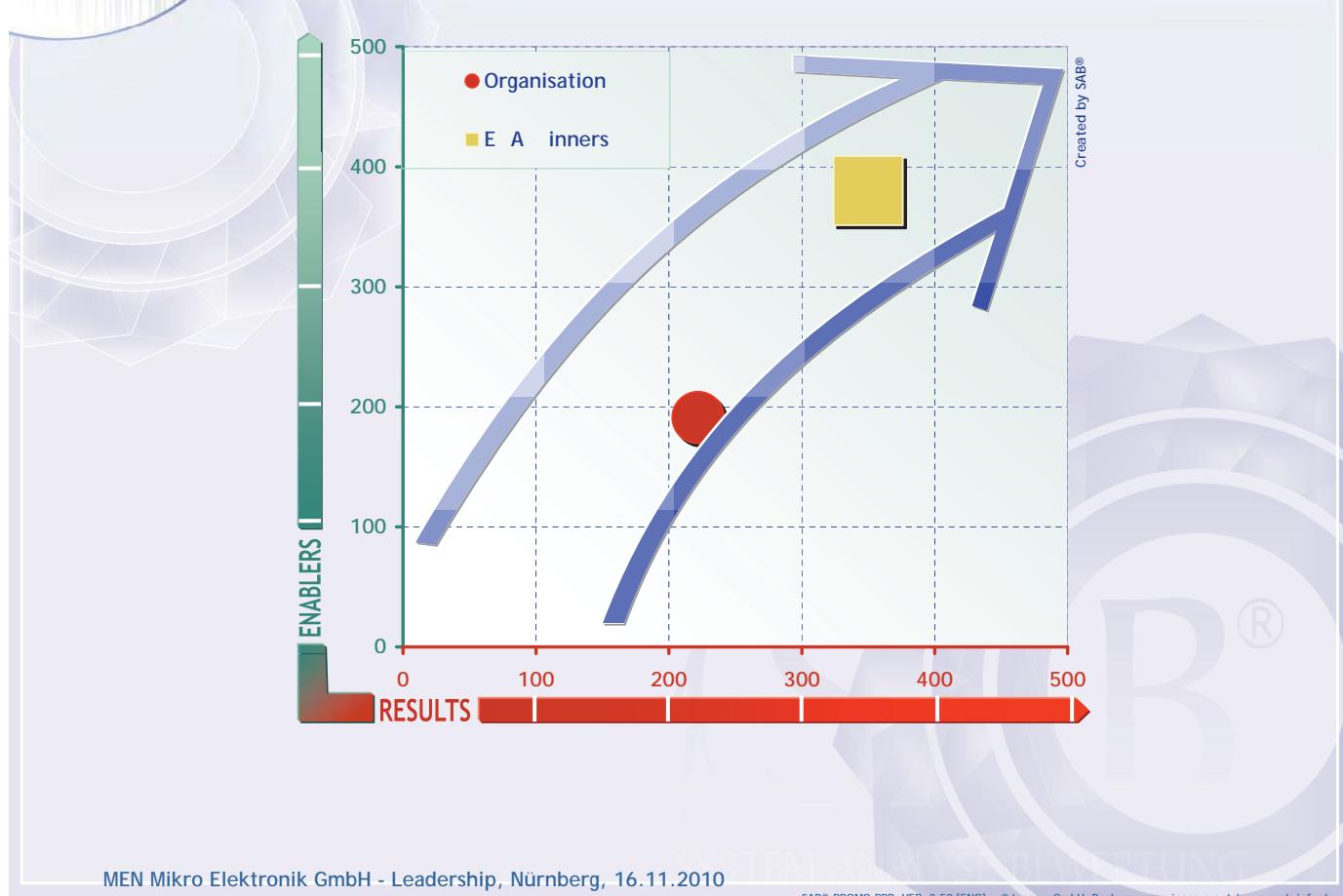
Results - Areas for Improvement

NR	AREAS FOR IMPROVEMENT			
7-03	Recognition of employees and teams by leaders.			
9-02	Profit margin.			
9-06	Liquidity and Cash Flow.			
7-07	Learning and training opportunities.			
...	...			
9-14	Prozessdurchlaufzeiten	35	82	47
9-05	Deckungsbeitrag	38	83	45

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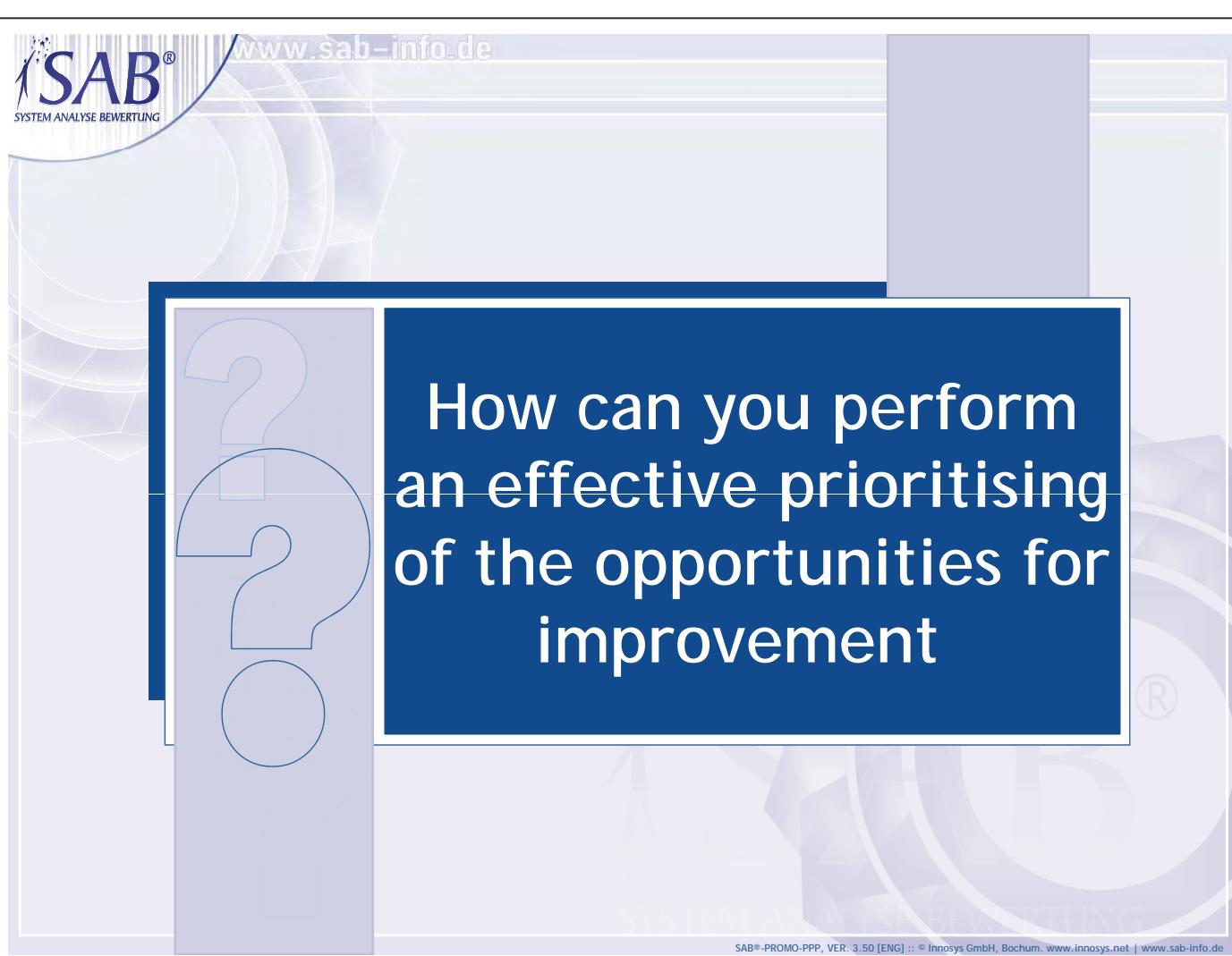
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Prioritizing criteria

eighting

P Impact on Key Results

P Feasibility

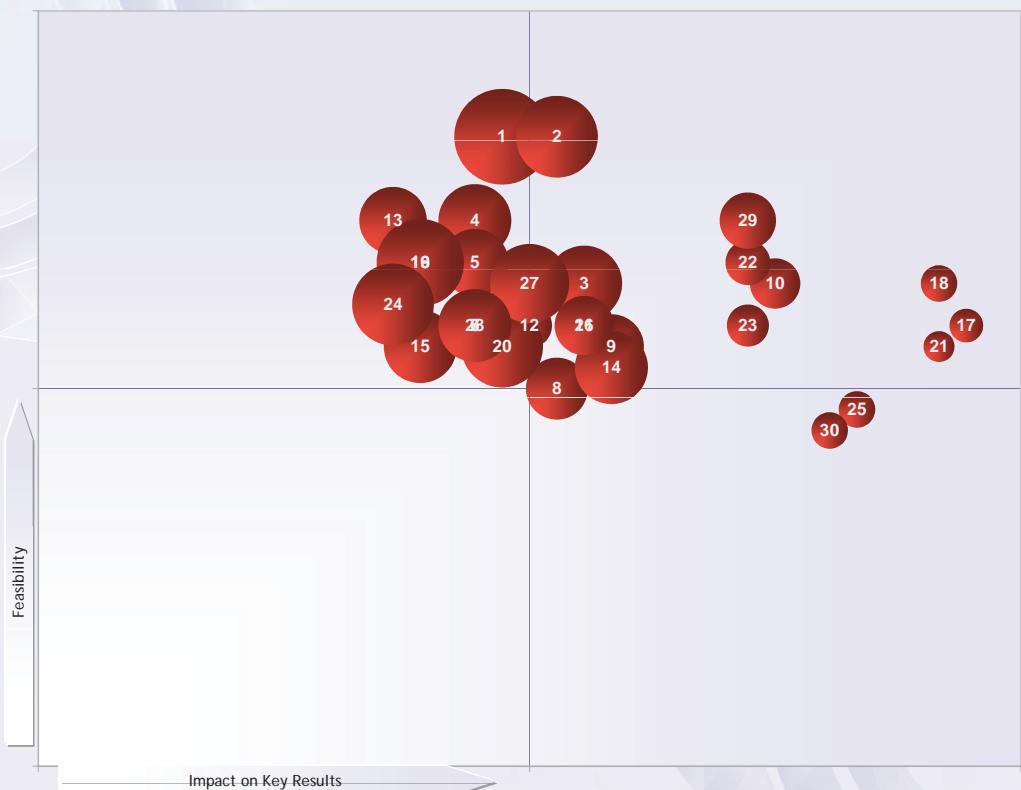
P Internal Impact

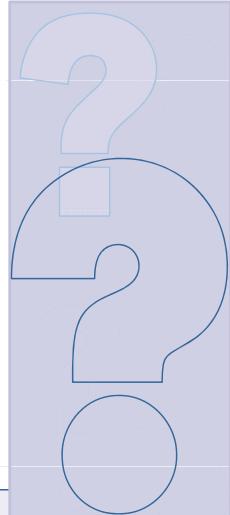
P External Impact

Ranking P1-P2-P3-P4

r.	C.	Ranking - P	P	P	P	P	S	P
17	9-02	Umsatzrendite	94,4	58,3	33,3	36,1	57,2	1
18	9-06	Liquidität und Cash Flow	91,7	63,9	36,1	38,9	58,9	2
21	9-17	Lagerbestand und Umschlagshäufigkeit	91,7	55,6	30,6	36,1	55,0	3
r.	C.	Ranking - P	P	P	P	P	S	P
1	3-17	Mitarbeitern Anerkennung zollen, um ihr Engagement und selbständiges Handeln zu fördern und aufrecht zu erhalten.	47,2	83,3	94,4	36,1	66,4	1
2	1-02	Eine klare Richtung und eine Strategie definieren und allen Mitarbeitern vermitteln, damit diese die Ziele der Organisation unterstützen und verwirklichen.	52,8	83,3	80,6	33,3	63,3	2
4	3-08	Ihre Mitarbeiter beurteilen und ihnen dabei helfen, ihre Leistung zu verbessern, ihre Mobilität und Beschäftigungsfähigkeit zu erhalten.	44,4	72,2	72,2	27,8	55,0	3
r.	C.	Ranking - P	P	P	P	P	S	P
1	3-17	Mitarbeitern Anerkennung zollen, um ihr Engagement und selbständiges Handeln zu fördern und aufrecht zu erhalten.	47,2	83,3	94,4	36,1	66,4	1
16	7-03	Anerkennung der Leistungen	38,9	66,7	86,1	38,9	58,6	2
2	1-02	Eine klare Richtung und eine Strategie definieren und allen Mitarbeitern vermitteln, damit diese die Ziele der Organisation unterstützen und verwirklichen.	52,8	83,3	80,6	33,3	63,3	3
r.	C.	Ranking - P	P	P	P	P	S	P
23	6-15	Anzahl und Häufigkeit von Reklamationen	72,2	58,3	41,7	80,6	61,9	1
22	9-18	Qualität, Liefertreue und Preiskonditionen der Lieferanten	72,2	66,7	44,4	75,0	63,3	2
29	9-14	Prozessdurchlaufzeiten	72,2	72,2	55,6	69,4	66,7	3

r.	c.	Final Prioritizing	P	P	P	P	S	P
29	9-14	Prozessdurchlaufzeiten	72,2	72,2	55,6	69,4	66,7	1
1	3-17	Mitarbeitern Anerkennung zollen, um ihr Engagement und selbständiges Handeln zu fördern und aufrecht zu erhalten.	47,2	83,3	94,4	36,1	66,4	2
22	9-18	Qualität, Liefertreue und Preiskonditionen der Lieferanten	72,2	66,7	44,4	75,0	63,3	3
2	1-02	Eine klare Richtung und eine Strategie definieren und allen Mitarbeitern vermitteln, damit diese die Ziele der Organisation unterstützen und verwirklichen.	52,8	83,3	80,6	33,3	63,3	4
23	6-15	Anzahl und Häufigkeit von Reklamationen	72,2	58,3	41,7	80,6	61,9	5
10	2-16	Die Strategie und die unterstützenden Leitlinien systematisch umsetzen, um die angestrebten Ergebnisse zu erreichen.	75,0	63,9	50,0	50,0	60,3	6
14	1-15	Das volle Potential der Mitarbeiter erschließen, damit diese Ihren Beitrag zum eigenen und dem Erfolg der Organisation leisten können.	58,3	52,8	72,2	47,2	59,2	7
3	3-06	Sicherstellen, dass Trainings- und Entwicklungspläne den Mitarbeitern helfen, die zukünftig in der Organisation benötigten Fähigkeiten und Fertigkeiten zu erwerben.	55,6	63,9	75,0	36,1	59,2	8
18	9-06	Liquidität und Cash Flow	91,7	63,9	36,1	38,9	58,9	9
16	7-03	Anerkennung der Leistungen	38,9	66,7	86,1	38,9	58,6	10
27	7-01	Führungsverhalten und Management	50,0	63,9	77,8	33,3	57,8	11
17	9-02	Umsatzrendite	94,4	58,3	33,3	36,1	57,2	12
20	7-16	Effektivität der Kommunikation	47,2	55,6	80,6	38,9	57,2	13
9	2-18	Die individuellen und Teamziele mit der Strategie der Organisation abstimmen, um die Mitarbeiter/Teams in die Lage zu versetzen, ihren Beitrag zu maximieren.	58,3	55,6	63,9	41,7	56,1	14
19	7-07	Möglichkeiten zur Aus-, Fort- und Weiterbildung	38,9	66,7	80,6	33,3	55,8	15

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Planning and monitoring of improvement projects

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Planned projects for Improvement

- Project 0210 Optimizing processing time
- Project 0310 Employee motivation
- Project 0410 Optimizing product quality

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Project: 0410 Optimizing product quality

Short Description:

- Improving product quality and reducing quality costs
- Improving the EFQM item - number and frequency of complaints

Project Targets:

- Reducing the external return flow rate
- Reducing the internal return flow rate

Which key figures or indicators can be used to assess the improvement

- Indicator rejection rate external
- Indicators SMD FP and final inspection FP internal
- Ratio of update production orders and normal production orders
- Faults per week test equipment, quality
- Duration of rework in the test field in relation to the standard time

Measures:

- Higher test coverage in final inspection
- Improved development quality
 - More detailed verification but with right priority
 - Parallelization of advance environmental qualification and development tests
 - Mechanical prototypes before layout release
 - Taking more advantage of the experience of colleagues
 - Including the right colleagues/ departments early-on
- Better decoupling of prototype and series production
 - Shorter production times of prototypes
- Knowledge of employees
 - Example mechanical design, coating, EMC, production
- More activities, clarifications and authorities of the process planning department
- Modern technologies, processes and equipment in production

Projektplan 0410 Produktqualität MEN-EF M Selbstbewertung 16.11.2011



Project Head:

- M. Plannerer Head of Development

Team Name, Function :

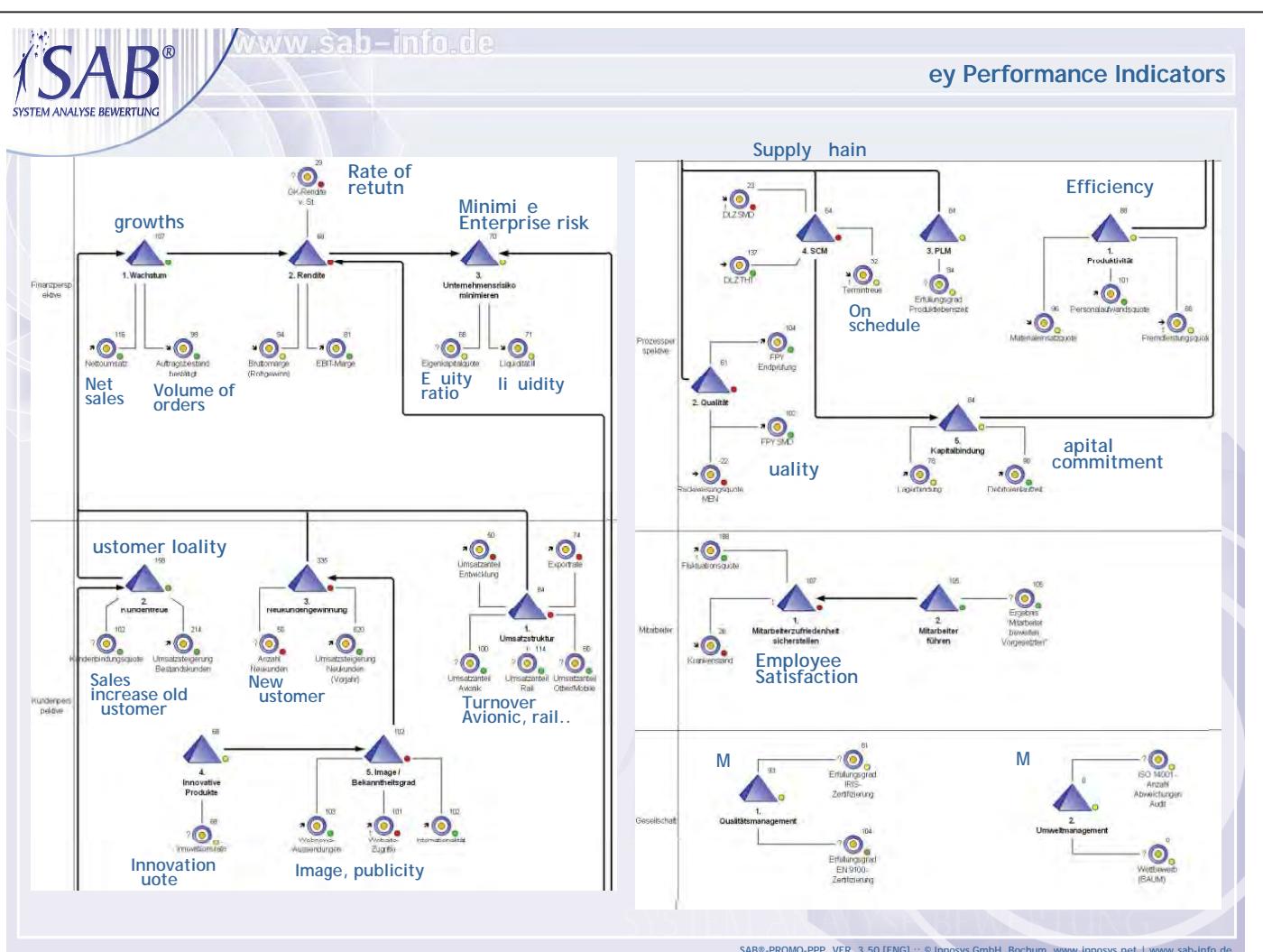
- W.Stys Quality Management
- R.Kammerer Head of Manufacturing
- H.Schubert Head of Hardware
- M.Schmitz Technical Director

Decision Board:

- see above

Action Items for <Project/Board>								
1	Item inserted by	Insertion Date	Detailed description	Classification	Assigned to	Due date	Comments	Status
2	No.							
	43	M.Schmitz	2011-03-18 Änderungen an Stücklisten Änderungen an Prototypenstücklisten durch HW ist ein Problem - Vorschlag bevor C-Stückliste bestückt wird muss die EW gefragt werden	non-critical	M.Schmitz		Für Prototypen müsste die Stückliste nicht gepflegt werden Ebenfalls ist ein Übergang von C auf F zu erwarten Achtung: gravierende Bauteiländerungen würden hier ein Problem erzeugen 27.05.2011 hängt ebenfalls an PLM System Idee: C-Stücklisten über AV in die Fertigung Beschluss: Freigabe der C Stücklisten soll umgesetzt werden! AI: MPL lädt Besprechung ein: M.Schmitz, S.Zaruba, R.Kammerer, H.Meyer, F.R.Vogler 29.04.2011: M.Schmitz lädt zu einer weiteren Besprechung ein	in work
	44	M.Schmitz	2011-03-18 Programmierfiles werden in den Stückliste gepflegt	non-critical	M.Schmitz		Testprojekt auf F19P Programmierung erfolgt direkt aus Ressourcenliste 27.05.2011 noch etwa 2 Wochen Dauer in der IT	closed
	45	M.Schmitz	2011-03-18 Einkaufsteile, zweistufige Freigabe 1. Sonderfreigabe 2. Fiktive Freigabe M.Schmitz treibt Änderung voran	critical	M.Schmitz		29.04.2011: Einfluss durch Omnyfy 27.05.2011: Alternativprodukt von Infor Hersteller wird nun begutachtet	in work
	46	W.Stys	2011-03-18 MHD von Hilfssstoffen z.B. Gappads W.Stys klärt Verlängerung des MHD Pflege des MHD in Infor W.Stys kümmert sich um das Handlung der Hilfssstoffe	non-critical	M.Stys		29.04.2011: Umsetzung ist bereits gestartet. System sollte ab nächster Woche funktionieren 27.05.2011: System läuft bereits	closed
	47	M.Planer	2011-04-29 Probleme bei kurzen Sprg Einbrüchen		H.Schubert		29.04.2011: MPL setzt sich mit Hschubert	in work

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27.09.2011



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