IT FORUM WEST, PRODUCTION & IT
28. November 2013

Product Lifecycle Management
Vom Geschäftsnutzen zur implementierten Lösung.

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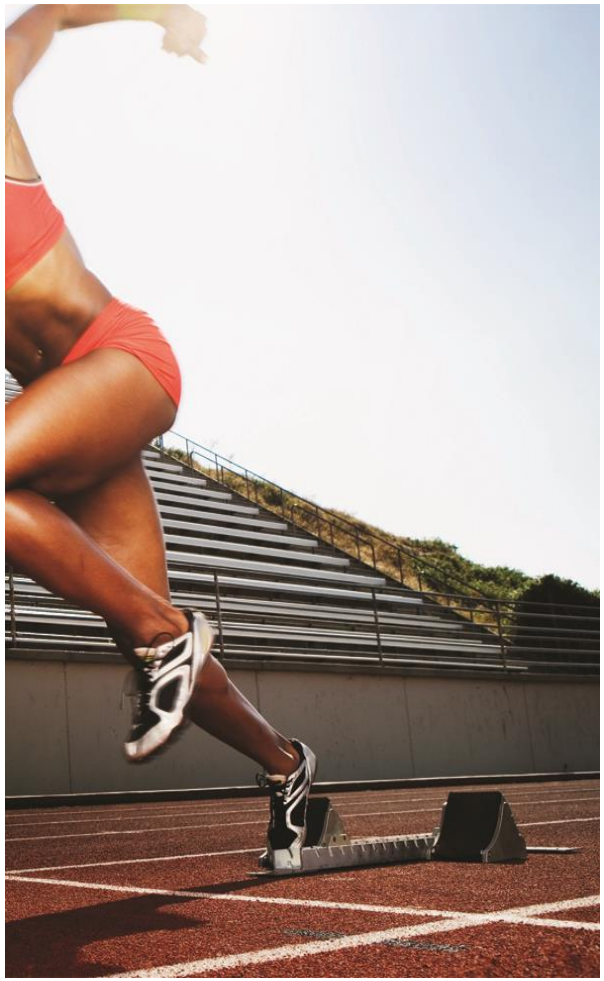
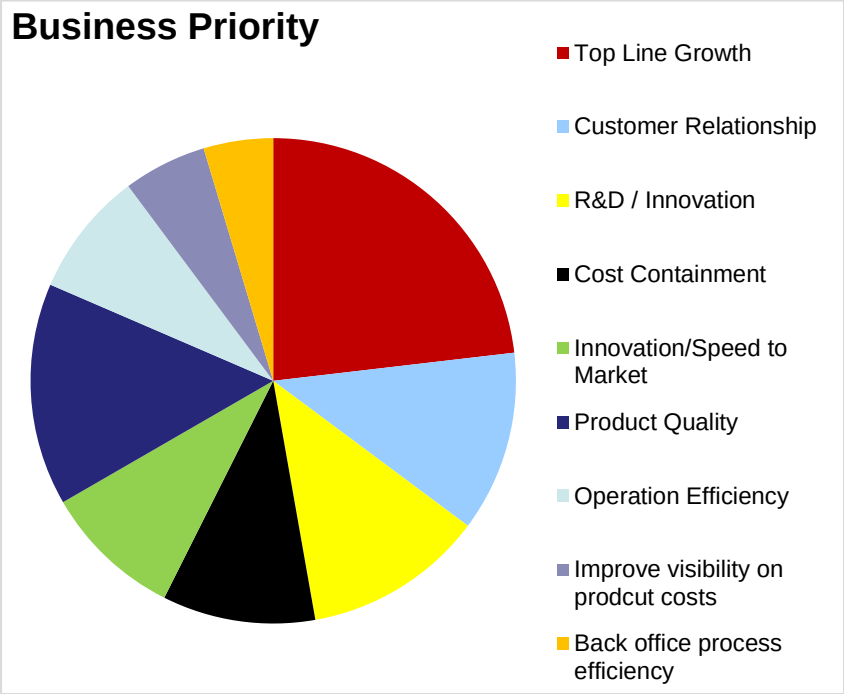
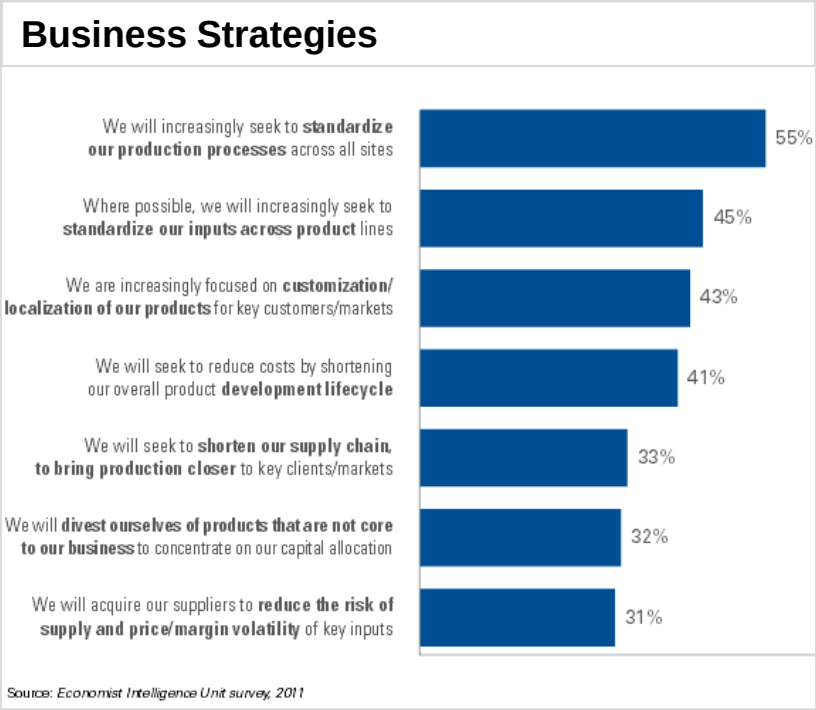
Agenda

- Challenges in Manufacturing & IT- Impact
- Example: Engineering collaboration
  - Maturity assessment & roadmap
  - Model based implementation
- Use case examples
- Summary: Roadmap – today → tomorrow



In next 2 – 3 yrs. - **Growth, Quality, Client Focus, Innovation** – are business focus areas (Analyst Report).





1. Top Line Growth
2. Product Quality
3. Customer Relationship
4. R&D / Innovation

1. Standardize Production Processes
2. Adaptive Manufacturing
3. Customer / Localized Products
4. Shorten product Lifecycle

Summary of **Manufacturing Challenges** and the **impact on IT**.

Challenge	Business KPI	Impact on IT
Standardization of Product families and Processes across Manufacturing sites	➢ Percentage of reusable parts ➢ Lower Inventory costs ➢ Reduce Orders fulfillment lead time	• C&H of Core IT Solutions (PLM, SCM, MES) • Standardize design Configurator
Customization / Localization of products to suit customers / Markets	➢ Lower cost design localization ➢ Lead time - average local change ➢ Reduce suppliers costs across sites	• Engineering Collaboration (R&D) and sourcing systems • Change management systems
Need for Suppliers Collaboration from design to logistics.	➢ Number of design CRs ➢ Design change cycle time ➢ Approval rate of CRs ➢ Lost Cost by design Change	• Supplier Collaboration platform • Integrated PLM-SCM system
Reduce cost by shortening the overall Product Development Cycle	➢ Lower NPDI Cycle time ➢ Reduce cost of Innovation ➢ Maximize re-use of products modules	• PLM Systems • Partner collaboration (SCM, PLM) • Product & Project planning system
Shorten supply-chain by bringing production closer to customer/Markets	➢ Increase global sourcing ➢ Lower inventory costs ➢ Reduce lead time for customer orders ➢ Increase availability of spare parts	• SCM systems • ERP-PLM integration

We see an escalating need for **collaboration** to handle key Industry challenges.

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Customer order driven supply chain

Companies are viewing their channel partners as more of a "network" which is critical to achieving a "demand-driven" supply chain, i.e. one that provides a real-time view to total demand, supply, and capacity information. For companies of all sizes, genuinely closer working relationship between suppliers and other partners will be critical to maximizing

Collaborative Innovation

Collaborating with partners and suppliers on innovation **helps to bring the best ideas to the table quickly and gives manufacturers an edge**. Choosing the right partners and opportunities is critical. Who works best with our company? Do we have the right processes to ensure speed to market? Moving past business as usual is essential to succeed in the new economy.

Ken Seel
Global Head of Conglomerates, KPMG in the US

Supply Chain optimization

Visibility is the new watchword in supply chain optimization and a major opportunity for many companies. Many companies have a substantial opportunity to boost performance, agility, and resilience by improving visibility across their supply chain network. Nearly half of the

Supplier value - Logistics to Innovation

Increasingly, companies are placing the supply chain at the center of their strategies to innovate. Many companies are starting to see their suppliers as a source, not just of production and logistics, but also of ideas. Half of our survey respondents say that partnerships, rather than in-house efforts, will characterize the future of innovation. And investing in R&D and innovation remains a priority: 42 percent expect their company to invest greater than of their revenue in over the next 2 years.

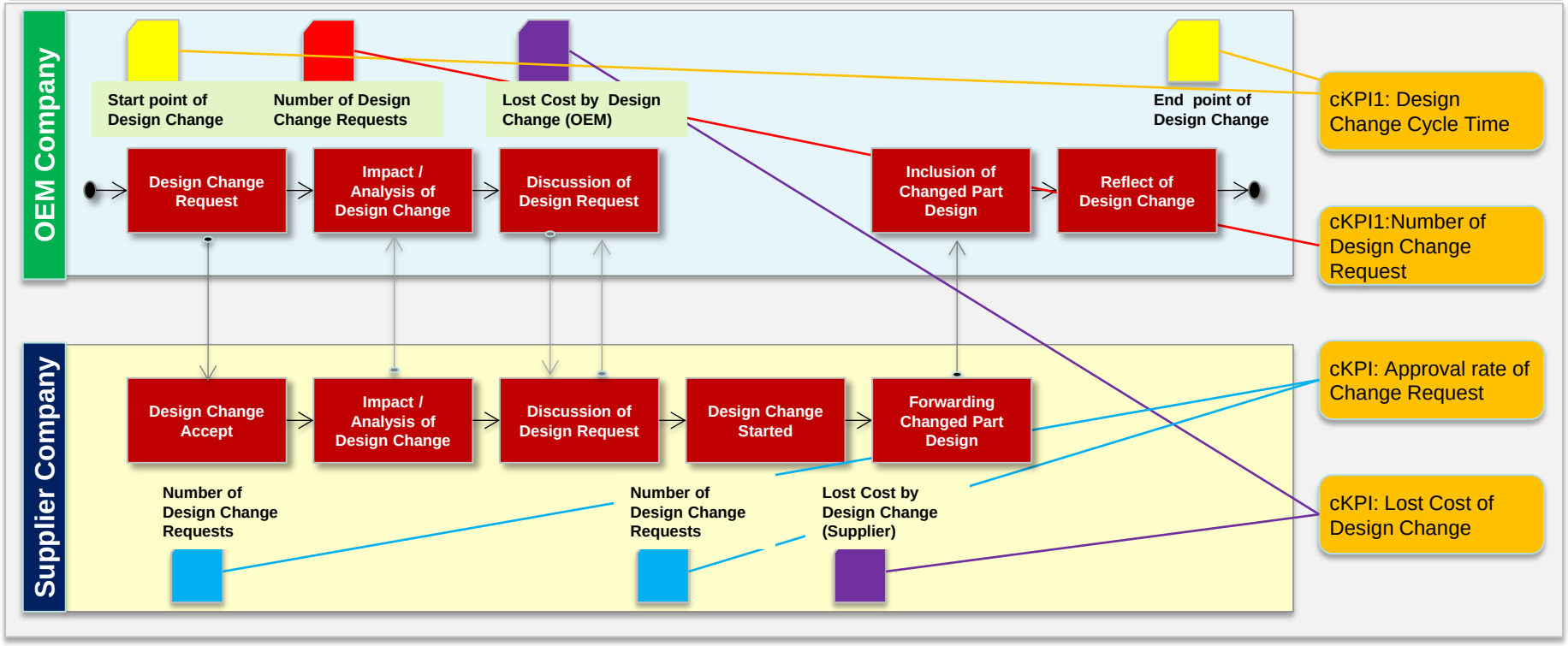
Incremental Innovation

Companies see value in both breakthrough and incremental innovation to stay competitive. Nearly a third of respondents whose firms are stepping up R&D say their company will invest in breakthrough innovation. The remaining two-thirds of respondents who see a resurgence of R&D activity are focused on incremental innovation – enhancing existing product lines and services. This number rises to 78 percent among larger

The Customer **Maturity Assessment** evaluates the client situation compared to industry-practice.

Supplier Integration Maturity Model				
Topic / Practice	**Average Practice**	**Best Practice**	**Next Practice**	**Future**
Supplier Information Management	Vendor and vendor part information is managed differently at each plant.	A global approved vendor list is kept for each purchased component. The status of each vendor component is managed to reflect current vendor performance. Processes are in place to ensure that Vendor parts are re-used across product lines and plants.	The global vendor database contains information to support collaboration processes such as Direct Materials Sourcing and Design Data Exchange. The vendor database is updated automatically as a result of the Sourcing process.	Vendor self-maintains administrative information such as contacts.
Direct Materials Sourcing	Manual RFI/RFQ/RFP processes driven locally using spreadsheets and email.	Automated, standard system for executing RFI/RFQ/RFP process. Manual inclusion of part specifications.	Automated global process integrated with New Product Introduction and Product Change processes. Approved agreements are sent to ERP system for P.O. processing.	Multi-dimensional informed supplier selection decisions based on performance, substance compliance, …). Bids can be compared against targets at a detailed level.
Supplier Data Exchange	Buyers sends drawings to suppliers via email or places them on an FTP site as needed	There is an automated way to share product data with authorized suppliers. Any authorized PLM user can initiate the data exchange process.	Data Exchange processes are triggered by a PLM process flows, ensuring that suppliers are always kept in synch with designs, project schedules, etc.	Suppliers initiate Data Exchange processes for proactive participation in the product development process.
Change Management	Change information is manually shared with suppliers after the change is approved.	The cost impact of changes is broken down by part. For important or complex changes, supplier input is gathered manually to assess impact before the change is approved.	There is an automated means to collect cost impacts from suppliers before business decisions are made. Analytical tools are available to compare new quotes to old quotes at a detailed level.	Analytical tools are available to predict purchased part cost changes due to fluctuations in raw material prices and exchange rates, as well as proposed product design changes.

Performance of **Engineering Collaboration** has to be managed **end2end**.

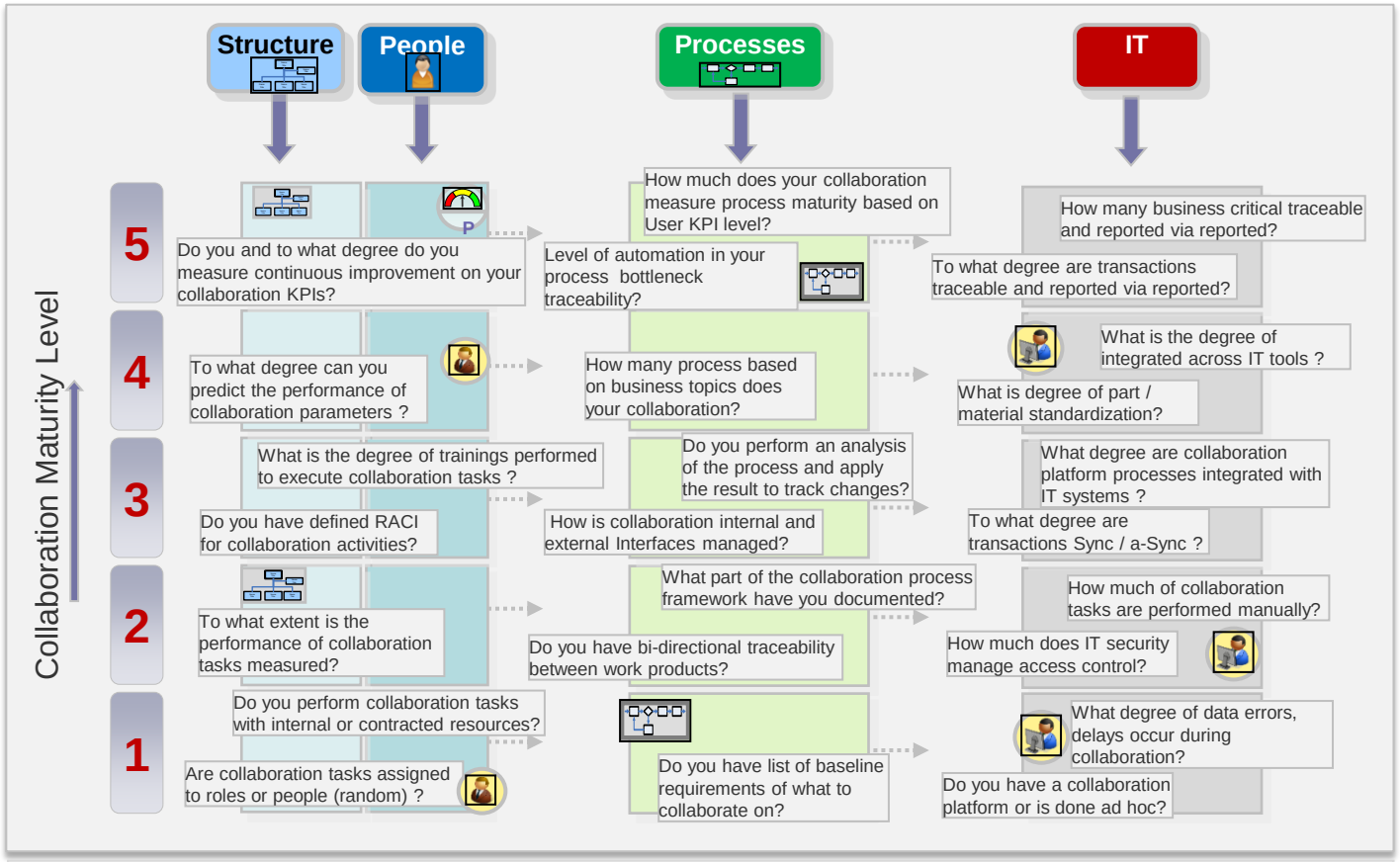


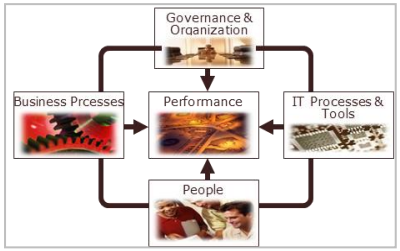
	KPIs	Actuals
OEM Company	design change cycle time of leading company	4 days
	# of design change requests by additional requests	3
	# of design change approvals	3
	loss cost by design change of leading company	Euro 40.000
Client Company	design change cycle time of part company	7 days
	# of design change requests by part design errors	4
	# of design change requests of part company	3
	loss cost by design change of part company	Euro 70.000

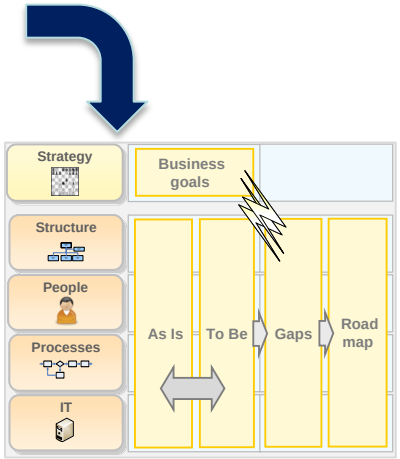
Another Definition of **Maturity Levels** for **Engineering/Supplier Collaboration**.

Maturity Level	Level Title	Supplier Collaboration Maturity Level Description (IT-driven)
5	Symbiotic	• Highly automated integrated supply from engineering to strategic procurement and suppliers • Synchronous business collaboration processes (quasi real-time) intensively utilized • Automated Tracking and integrated Business Intelligence to apply an win-win model for both partners.
4	Collaborative	• Internet-based Supplier Management & Rating, Program Management, Design for Sustainability • Production Material Meta-Catalogs, Supplier Information Exchange (RfX) and i-Auction utilized • Still mostly asynchronous information exchange with some attempts to move to synchronous business processes
3	Partnering	• Support from top management for integrated supplier collaboration processes • First attempts to establish an integrated supplier collaboration environment (i.e. Design-to Cost) • First attempts with asynchronous supplier collaboration infrastructure for collecting experience
2	Opportunistic	• Some ideas are exercised about systematic supplier collaboration • Manual processes for supplier collaboration executed • Processes are maintained by experienced employees • No “Design-for-Sustainability”, no “Design-to-Cost” methodology in place • No activities yet in place for integrated supplier management
1	Combative	• No engineering/supplier collaboration process and infrastructure in place • Interaction happens ad-hoc and randomly using phone, fax or email. • This approach poses a high chance of communication errors, ineffective planning and delays in receiving design information from the supplier

Maturity Assessment **Questionnaire** evaluates **key-areas** and integrates **Industry standards**.







Industry standards used within the assessment framework are CMMI, CMII, Aachen Model and DCOR

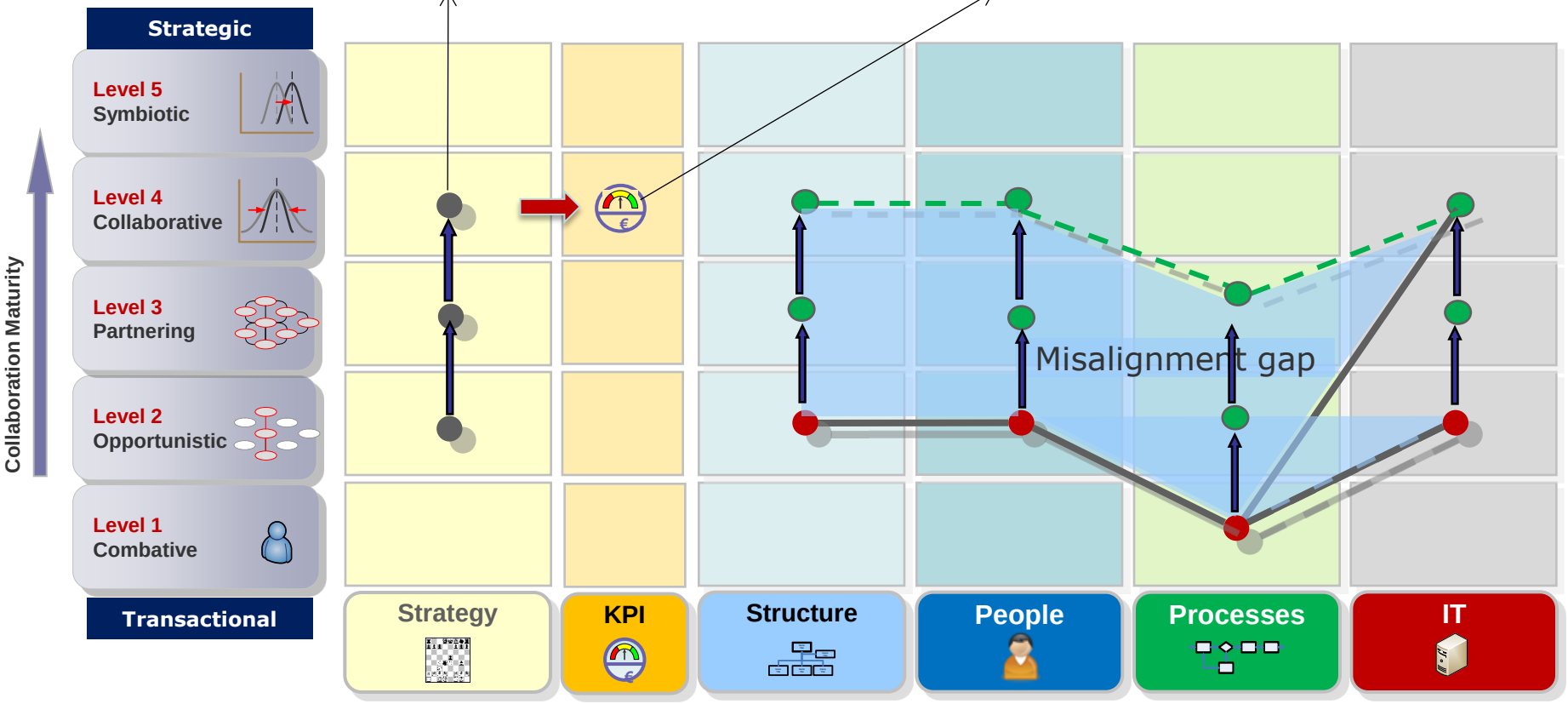
Strategy is translated in **improvement steps** for **key-areas** – called **plateau**.

Strategy Matrix

- Manage performance of return processes cycle time
- Minimize number of CRs due to re-work / errors
- Increase 10 % Returns on every enhancement CR
- Pull down cost per change by 15%

Derived cKPI

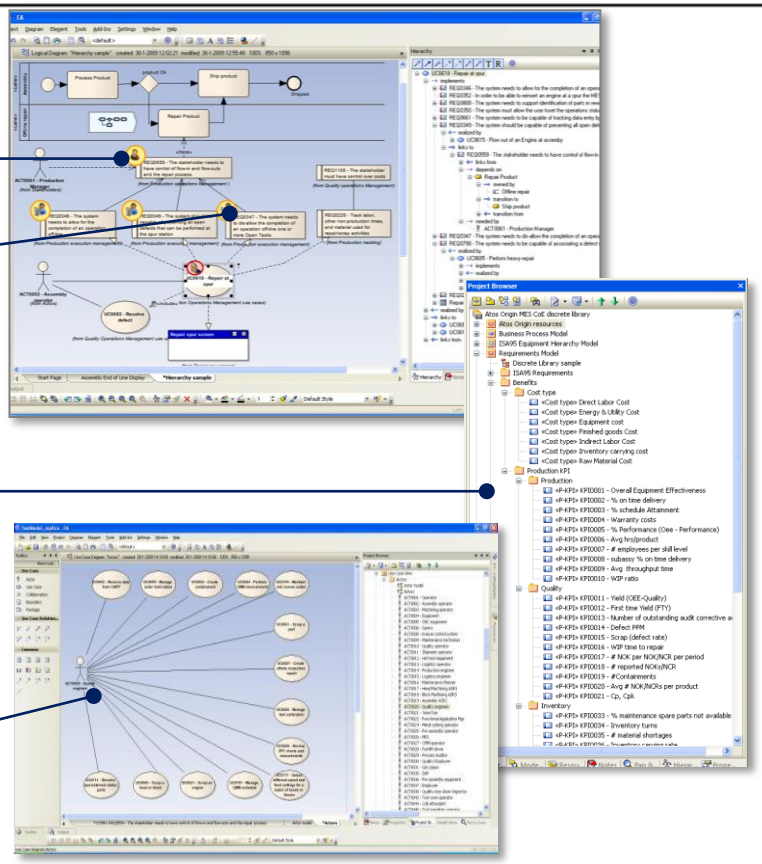
- Part design change cycle time
- Numbers of design change requests
- Rate of change request approval
- Loss cost by design change



Tool Based Approach - **M4PLM*** - is supporting definition and realization of the **transformation**.

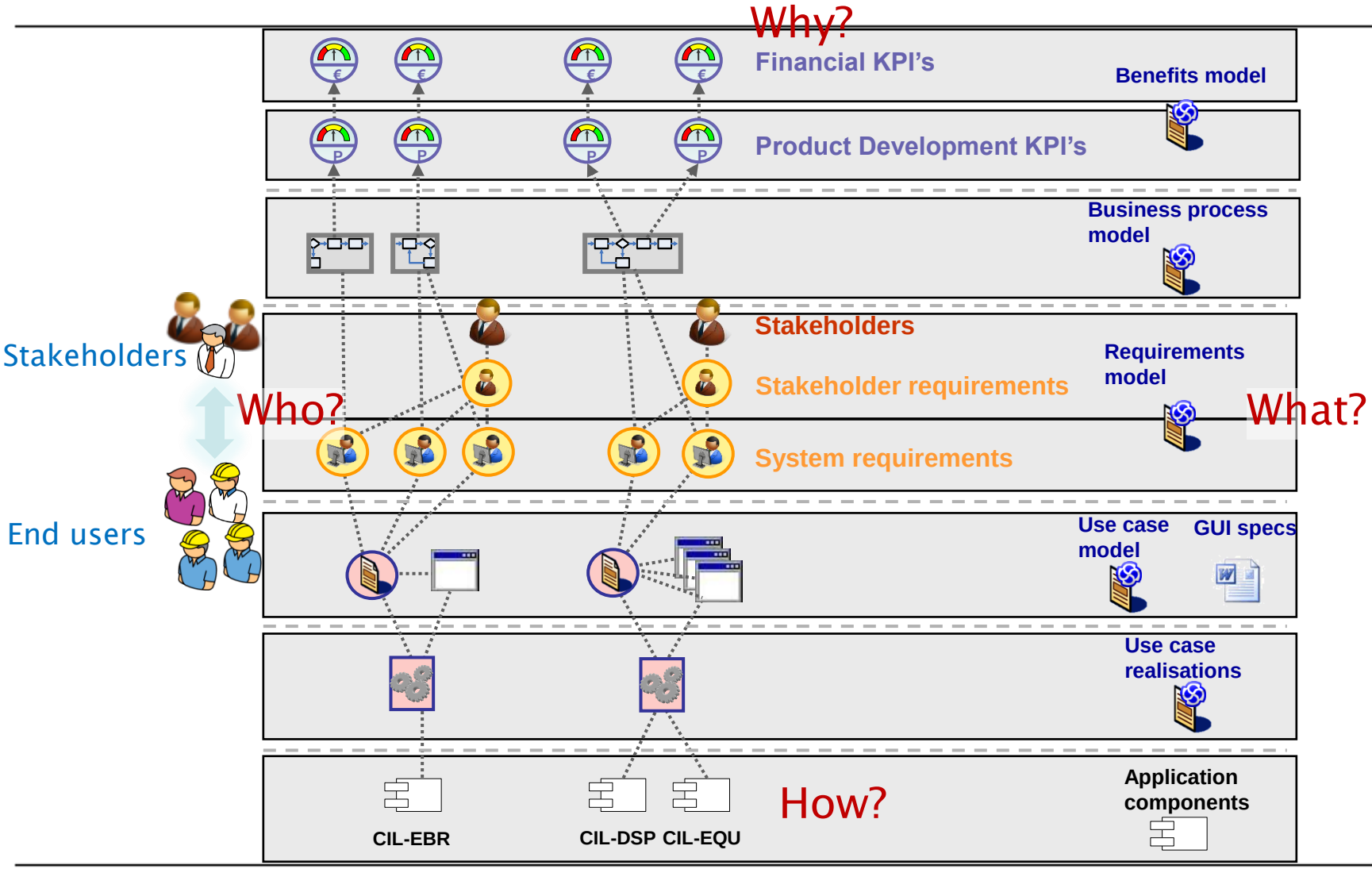
Capture of different artifacts from customer and Industry best practices, KPI etc.

- Stakeholder requirements
  - Describe the problem and results the stakeholder is expecting
- User requirements
  - Describe the solution: what the user expects the system to deliver/do
- Metrics/KPI's
  - Metrics and KPI's that the client uses to monitor and improve the performance of his processes. The difference between Target and Current values can represent a cost saving as a result of the implementation of requirements
- Cost types
  - Breakup of Supplier collaboration costs. These are defined to be able to financially quantify the impact of an improved KPI.
- Use case specifies what Supplier Connect will do in response to an actor's actions.
  - A use case usually begins with a verb (e.g., register supplier, sent to supplier, import / export to supplier).
- Screen definitions specify the application screens



M4PLM = Methodology for PLM

M4PLM **links** IT related issues with business issues in **sub-industry based models**.



Increased **engineering collaboration between partners** (OEM & Suppliers)

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Business challenge

- Supplier Profile Management for Tactical and Strategic sourcing.
- Supplier information management, qualification, classification and self service
- Provide a smooth exchange of RFX information such as purchasing BOM, sourcing task list, online quotation, bidding analysis and cost breakdown comparison.
- Report & review the supplier performance.
- Compatibility / Integration with other enterprise systems (PDM/ERP).

Solutions

Effective Collaboration between Suppliers & OEM for the following business topics:

- **Direct material sourcing** – specifications, product cost management, collaborative product design…)
- **Program Management** –(Quality, CAPA, Cost Management, Warranty Mgmt.)
- **Procurement** – (sourcing, catalog parts, spend management) for Product Eng.
- **Sustainability** – Material & Substance Compliance,

Benefits

- Consolidation of Vendor information for strategic sourcing across the enterprise.
- Impact to 80% of cost that is committed in the first 20% of the design cycle
- Cost breakdown (Labor, Tooling, Material, Process, Logistics) enables high fidelity value engineering; benchmarks point to up to 25% reduction in sub-systems.
- 5% –15% cost reduction in collaboration; 25% addition to value engineering

Individualization of products – challenges to PLM

28/11/2013

Business challenge

- Too many variances of any given product, globally (localization)
- Manage a global product design guidelines to be still be able to make local changes.
- Data exchange (collaboration) for design and BOM information.
- Global Vs. Local Change management
- Integration with downstream systems (Manufacturing, Sourcing etc.)
- Collaborative design and sourcing with suppliers (in case of global sourcing)

Solutions

- M4PLM assessment to baseline the as-is process and solution.
- Maturity scan on Bill of material management
- PLM-ERP integration to manage E-BOM, M-BOM & BOP
- Data Exchange platform across internal and external systems via. portal interface.
- System integration (if needed to integrate solutions other than PLM, ERP and MES)

Benefits

- Seamless and timely exchange of critical data across business domains
- Enable quick and sound change request management with predictable lead time.
- Establish sound master data management with clear RACI model.

Support **flexible manufacturing** (different manufacturing topologies)

28/11/2013

Business challenge

- Medium and large organizations engaged in manufacturing practice, having global customers and multiple product ranges have the following issues:
  - How to set-up global product development in combination to local design changes?
  - How should a plant manage products based on MTO and CTO at the same time?
  - How does design team exchange information with plants seamlessly.

Solutions

- M4PLM & M4MES assessment to baseline the as-is process and solutions for PLM and MES respectively.
- Maturity scan on Bill of material management
- Configuration Management including sales/design configurator set-up
- PLM-ERP integration to manage E-BOM, M-BOM & BOP

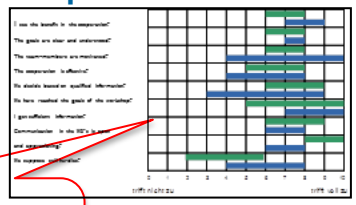
Benefits

- Achieve flexibility to “design anywhere – build anywhere”
- Will be able to manage product configurations in a modular build.

M4MES = Methodology for MES

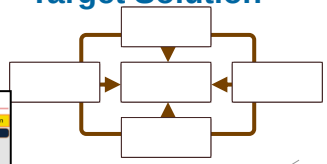
The **transformation roadmap** is built based on **plateau concept** which embeds a complete **tool set** leading to the target solution.

Cooperation Barometer

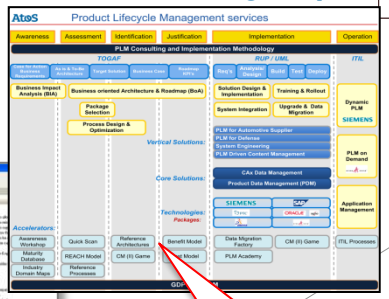


State and quality of cooperation between Atos and customer in the project is closely monitored

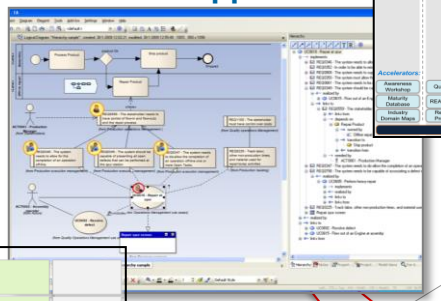
Plateau I Target Solution



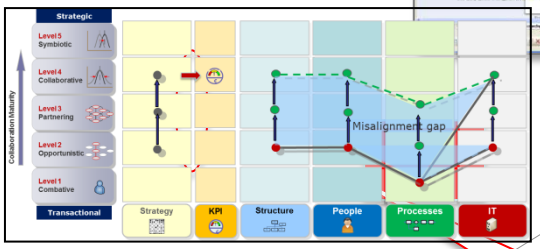
PLM Offering Map



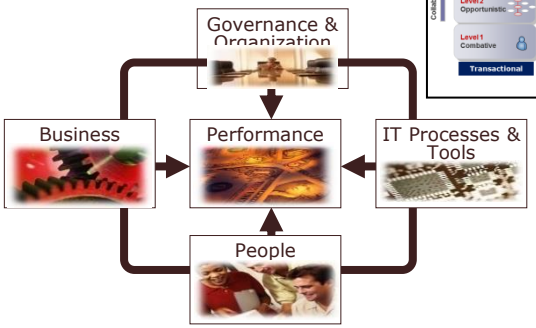
M4PLM Approach



Maturity Assessment



Start plateau As-is Solution



State of the Art tools support the best practice process and solution design

Identifies feasible solutions that can cover the target solution functionalities

Maps the current solution with best practices and defines the gap to the target state

Happy to get your feedback or questions:

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