

# Integrating Six Sigma and Lean for better results

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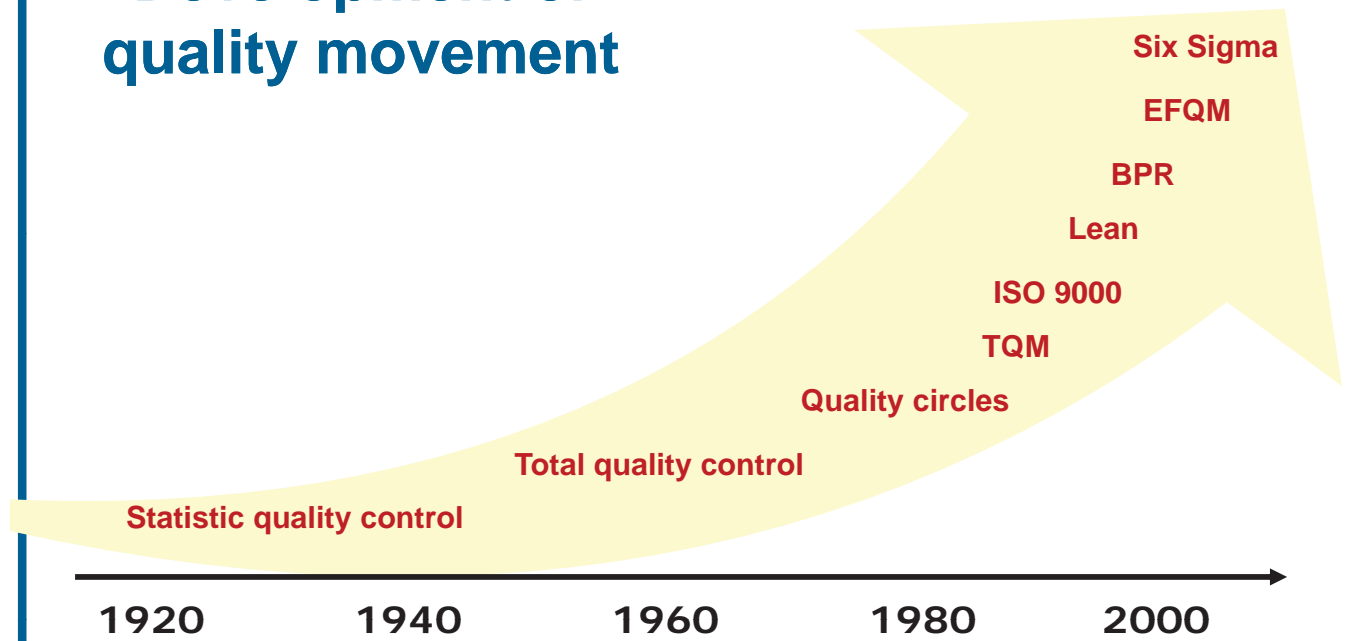
## What is in focus today?

### Six Sigma

### Lean



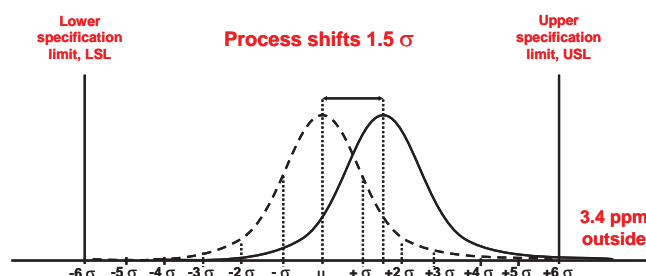
# Development of quality movement



*An evolution not a revolution!*



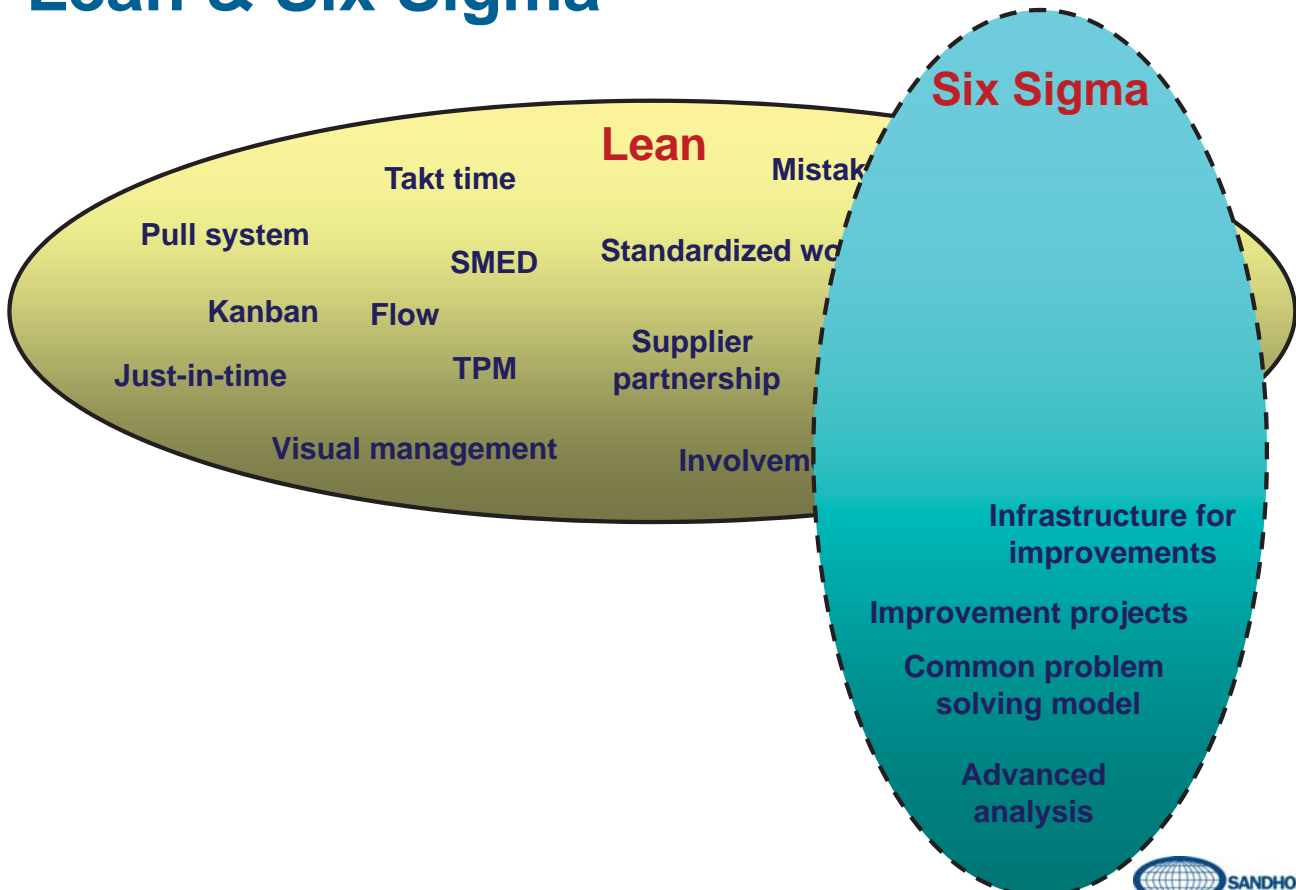
**Six Sigma** is a *systematic improvement concept* based on a *defined role structure*, a *common project model* (DMAIC) and deep competence about many *powerful problem solving tools*



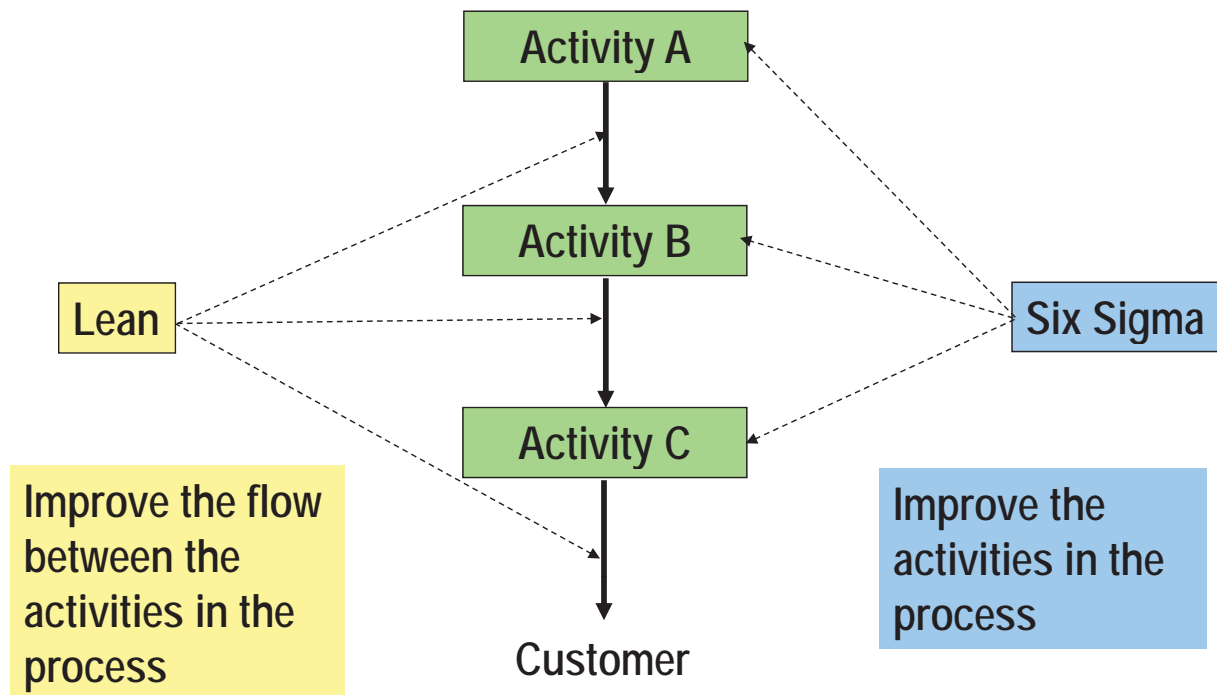
**Lean** is a *new way* to see, run and manage a business based on *effective, fast and flexible* processes that delivers nothing but a continuous flow of *value* controlled by the *customers needs*



## Lean & Six Sigma



# Lean & Six Sigma



Inspired by Ronald Snee



## Similarities



- Management focus
- Process focus
- Customer focus
- Elimination of waste and failures
- Continuous improvements
- Development of competence and learning



## Strong sides of Lean and Six Sigma

### Lean

- + Flow and process development
- + Employee participation
- + Cultural change
- + Strong philosophy with resolute principles
- + Focus on quality
- + Local improvement teams

### Six Sigma

- + Problem solving
- + Distinct leadership
- + Strategic result focus
- + Clear role structure, common methodology and many tools
- + Financial focus
- + Cross-functional improvements



## What is happening today?

**Lean Six Sigma**

**Six Sigma Lean?**



# How to integrate Lean and Six Sigma

1. Integration through management and leadership
2. Integration through competence and training
3. Integration through roles and organization
4. Integration through tools
5. Integration through methodology



## Integration through management and leadership

### *Leadership for continuous improvements*

- Respect for the individual
- Listen to employees and take care of their ideas
- Go and see the real situation
- Visual leadership - The leader as a model
- Decisions based on facts
- Quality is number one – right from me!
- Every failure and non-conformity is an opportunity
- Focus on continuous improvements and learning
- See the big picture, focus on customers and act long-term



# Scania Production System

We can summarize this leadership model with the following five principles:

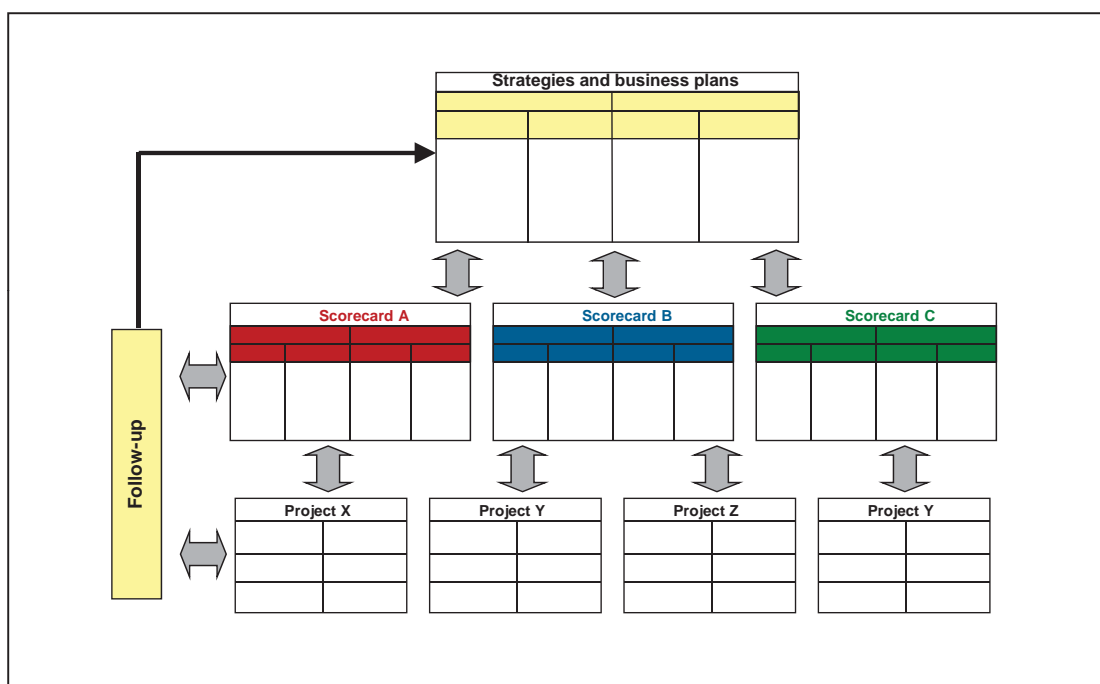
- Co-ordinate but work independently – take responsibility
- Work with details and understand the context
- Act now – but think long term
- Build know-how through continuous learning
- Stimulate commitment through involvement



Leif Östling, President and CEO,  
Scania 2009 Annual General Meeting



## Making quality to a strategic question

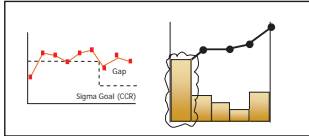




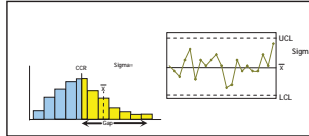
# Link Projects, Processes and Results through an Integrated Review Process

Corporate Business Result Status Report - Q1 '02	
1.0 CUSTOMER AND MARKET	
2.0 FINANCIAL	
3.0 INTERNAL	
4.0 LEARNING & GROWING	

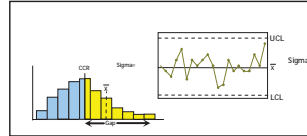
## Product Development



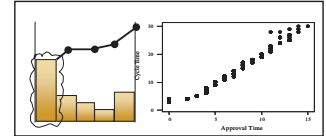
## Supply Chain



## Customer Acquisition



## Order To Cash



## Project A

**D**  Achievements This Week:

**M**  Key Findings:

**A**  Issues & Obstacles:

**I**  Next Steps:

**C**  Champions Comments:

## Project B

**D**  Achievements This Week:

**M**  Key Findings:

**A**  Issues & Obstacles:

**I**  Next Steps:

**C**  Champions Comments:

## Project C

**D**  Achievements This Week:

**M**  Key Findings:

**A**  Issues & Obstacles:

**I**  Next Steps:

**C**  Champions Comments:

## Project D

**D**  Achievements This Week:

**M**  Key Findings:

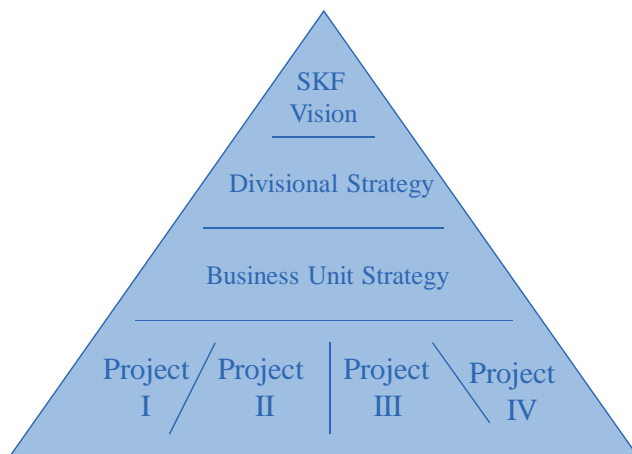
**A**  Issues & Obstacles:

**I**  Next Steps:

**C**  Champions Comments:



## Six Sigma Projects



How should this business compete?

What is the scope of change required for our division or business function?

What does this project or change initiative mean for us/me?

**The purpose of linking the SKF Vision, the Divisional and the BU's strategy and project is:**

To ensure the business units results aligns with the greater vision and strategy, and to meet the economic value

To ensure communications are consistent with the vision and business strategy

To ensure the coordination and effective implementation of change across all projects

To ensure that capability and participant understand the context of the "big picture"





## Integration through competence and training



- Continouose improvements has more to do with competence than methodology
- Knowledge prevents fundamentalism
- Knowledge gives understanding and humility
- Knowledge and and experiences from both Lean and Six Sigma gives an natural integration
- Integrate Lean in Six Sigma training and Six Sigma in Lean training
- Share and mix useful tools and methods between the two consepts
- Get understanding for the big picture and Business Excellence



## Training of quality specialists



- |   |           |
|---|-----------|
| ✓ Quality Manager training  | 20 days   |
| ✓ Master Black Belt training  | 40 days   |
| ✓ Black Belt training   | 20 days   |
| ✓ Green Belt training   | 5-10 days |
| ✓ Lean Leader training  | 15 days   |
| ✓ Lean Coach training   | 5-8 days  |
| ✓ Specific training in quality for specialists within different functions |           |



## Integration through roles and organization

- Creating an common improvement organization for all kind of improvements
- Scalabel models instead of parallell structures
- Involve all employees and managers in a improvement initiative based on all relevant tools and methods
- Choose namns that fits in your own organizational culture
  - Yellow Belt – Green Belt – Black Belt – MBB
  - Lean facillitators - Lean coaches – Lean leaders
  - Improvement leaders – Improvement leaders



## Improvements on different levels

Cross organizational improvements

Cross functional improvements

Local improvements

Individual improvements

# Lean Six Sigma roles

	BB-projects	GB-projects	Daily improvements
Sponsor/ Champion	Principal	Principal	Principal
Black Belt	Project manager	Coach	-
Green Belt	Project member	Project manager	Coach
Employees	Project member	Project member	Project manager/member

**+ Master Black Belt, Yellow Belt, White Belt, Six Sigma Leader, Deployment Champions, Controller etc**



## Integration through tools

- Use tools based on needs in the work instead of which concept you have chosen
- Tools should help – not be the goal!
- Share tools between Lean and Six Sigma
- There is a need for deeper knowledge and understanding for tools
- Most tools have existed for long time but the use and knowledge has often been weak
- New technology gives new opportunities to learn and use tools today



# Tools

FMEA      Test of Hypothesis      SMED  
Design of Experiments      Correlation analysis  
Value Stream Mapping  
Creativity and innovation  
Control charts      Process capability  
Minitab      Poka Yoke  
QFD      7+7 QC tools  
MSA Gage R&R      Muda      ANOVA  
Triz      5S

**And many more!**



## Integration through methodology and models

- Use one common scalabel model for continouse improvements and problem solving
- There are different good models, but it is confusing for people to use them all parallell
- A model should help and support but not complicate, control and limit
- DMAIC is a good model!
- Clear focus, analyze based on facts customer focus, fogus on root causes and understanding for people is critical issues



# Improvements of different complexity and difficulty

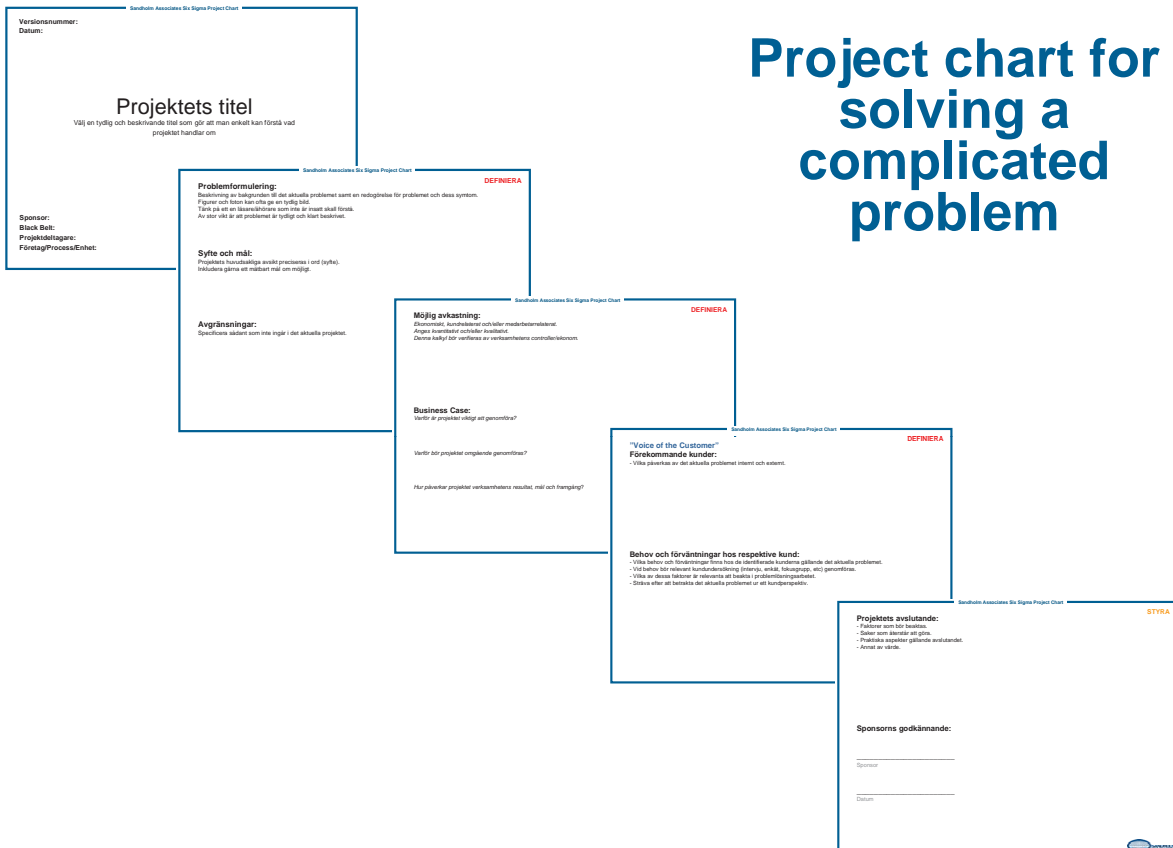
Advanced problem solving

Root cause analysis

Implementation of ideas



## Project chart for solving a complicated problem



Example – totally about 40 slides!



## Continuous improvements

### 1. Define

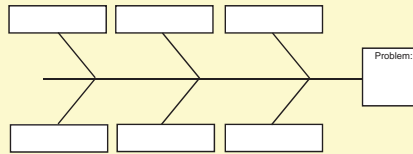
What is the problem?  
Could the scoop be limited?

### 2. Measure

Find facts that helps to learn more about the problem.

### 3. Analyze

Find the root cause to the problem.



### 4. Improve

Identify solutions to the problem that eliminate the root cause.  
Plan improvement and implement solutions.

### 5. Control

Maintain, follow-up and report results.

Date:

Group:

Department:



**Daily improvements**

Datum:

### Ständiga förbättringar - problemlösningsmetoder

Grupp:

Avd:

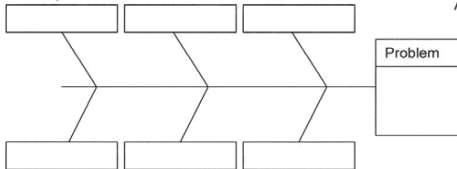
#### 1) Problem

- Vad är problemet?
- Vad är målet med förbättringen?
- Hur ser det ut när ni genomfört förbättringen?

#### 2) Fakta:

- Vilka fakta har ni som visar vad problemet är? (Måtl., tex antal stopp, tid, vikt etc)

#### 3) Orsak:



Alt. 5-Varför

Problem:.....

Varför:.....

Varför:.....

Varför:.....

Varför:.....

Varför:.....

#### 4) Förbättring

Ta fram förbättring som eliminerar grundorsaken	Ansv	Klart när?	OK

Innebär det större förändringar av maskinen.

- Ja  Nej  Gör Riskanalys
- 

#### 5) Följ upp

-Har ni nått målet?

Data	Före	Efter

- Behövs ny rutin?
- Dokumentation?

Coca-Cola  
Real

5-day 6-Sig<sup>ma</sup> Kaizen Approach To DMAIC In The Plants

Event Week Agenda

- I. Teach key DMAIC & Lean tools
- II. Apply the tools
- III. Deliver results daily to close DMAIC phase.



Time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
7:00am	DCM Kick Off (7:00am)	"Measure & Lean"	"Analyze" & Lean	"Improve & Lean"	"Control & Lean"
7:15am	"Define & Lean"	TRAINING	TRAINING	TRAINING	TRAINING
8:00am	APPLY "DEFINE"	APPLY "MEASURE"	APPLY "ANALYZE"	APPLY "IMPROVE"	APPLY "CONTROL"
9:40am	LUNCH & BREAK	LUNCH & BREAK	LUNCH & BREAK	LUNCH & BREAK	LUNCH & BREAK
10:00am					"CONTROL" Kaizen
11:15pm	APPLY "DEFINE"	APPLY "MEASURE"	APPLY "ANALYZE"	APPLY "IMPROVE"	"CONTROL" Kaizen
12:00pm					MANAGEMENT REPORT OUT (3:00pm)
1:00pm	DELIVER Day 1 assignments	DELIVER Day 2 assignments	DELIVER Day 3 assignments	DELIVER Day 4 assignments	
2:00pm					
3:00pm					

LBSK General Presentation, March 2007, VCM, Issuer: Geert Devos, CDS id: gdevos  
 Issue date: 2007-09-17, Security Class: Proprietary  
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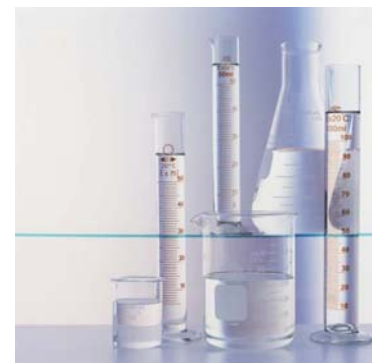


Source: TQR 2007

# DFSS & Lean product development

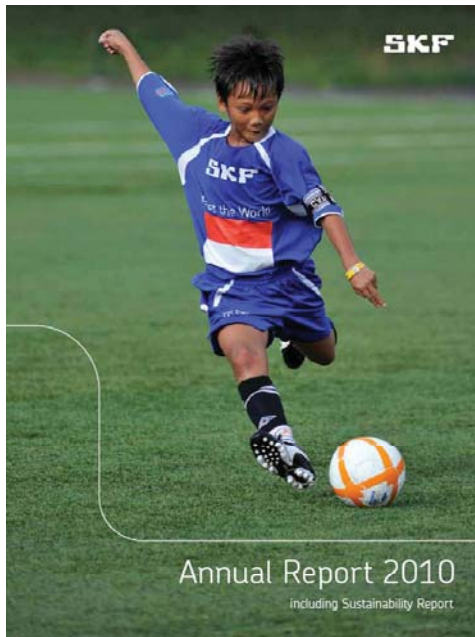
**DFSS** How to design robust products that meets the needs of the customers

**LPD** How to shorten time to market and make the design work more effective



**A transformation of the R&D process!**





Our second initiative is to **reduce costs and eliminate waste** in our business through the application of Business Excellence and through a strong focus on cost reduction in our products. One key activity for the Group in the coming years is to build on the success of Manufacturing Excellence and extend this approach to all the main activities and processes of SKF. We have already started this in a number of areas, such as product development and finance. This we call SKF Business Excellence and it builds on many of the steps that we have already taken in the Group over a number of years, such as TQM, Six Sigma and of course, Manufacturing Excellence.



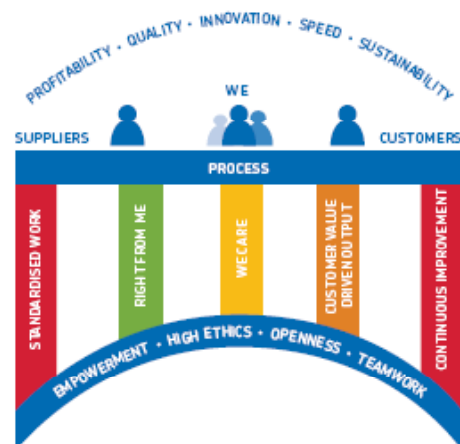
#### The Bridge of Business Excellence

The SKF Bridge of Business Excellence represents the role of SKF and its customers and suppliers in the process value stream, and the principles and values that support it.

The five Business Excellence principles support the bridge that represents the SKF business processes. These principles are shaped by the SKF values and supported by the methods that in turn lead to SKF's results.

The principles are;

- Standardised Work (safeguarding we fulfil our customers needs effectively and efficiently),
- Right from Me (ensuring our results meet the customers requirement),
- We Care (respect for each other and the external as well as internal environment),
- Customer Value Driven Output (the starting point, ensuring we bring value to our customer in everything we do),
- Continuous Improvement (always challenging and improving our normal working situation, eliminating waste for improved customer satisfaction and competitiveness).





# [www.sandholm.se](http://www.sandholm.se)

