



# The Long Path to the Summit

**Köster AG is working on a comprehensive restructuring program. With assistance from Porsche Consulting, the general construction contractor has already introduced integrated process management. This has served as the basis for a continuous improvement process which is managed centrally at Köster by an internal organization. This has now gradually ensured optimization of the individual process steps – from the quotation stage right through to the specific work on the construction site.**

[ ] Reiner Schloz [ ] Boris Schmalenberger



Köster AG has many different branches. Thirteen offices and one subsidiary company in southern Germany implement around 300 construction projects every year. The company's headquarters in Osnabrück keeps an eye on all projects, so that if the CEO Dr. Dieter Köster wants to find out how things are progressing on a particular site, all he has to do is look on the company's own intranet. There he can click on the relevant project-management map. From the quotation phase, production scheduling and production, right through to final approval, all the work steps are documented here in a precisely defined sequence.

Around 40 percent of Group annual sales (approx. 780 million euro in 2008) are generated by projects visualized with the aid of the project-management map, and implemented using the method which lean-manage-

ment experts call the "order handling process." This is a standardized, clearly defined procedure to which the people involved in all projects at all sites must strictly adhere. The change from a project-oriented to a process-oriented mode of operation provides Köster with a uniform basis for assessing all construction projects. Theodor Wilken, the director responsible for process development within the company, is clearly delighted with this: "We now have a completely new level of transparency. We always know exactly where we are and what we need to do next."

This is because the project-management map also quickly and clearly flags up deviations from the plan with the traffic-light colors yellow and red. The relevant interdisciplinary team decides how severe the problems or delays are. This team is made up of people in responsible positions from all of the areas affected, assesses the ▶

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### **Köster AG: A Specialist in Civil and Underground Engineering**

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The construction company Köster was founded in 1938 in Osnabrück by Heinrich Köster and is still 100 percent family-owned today. When Dr. Dieter Köster took over the company from his father some time ago he was responsible for 120 employees. Including all of its subsidiaries, the company today employs well over 1,500 people who generate sales of around 780 million euro. Köster AG itself has eight branch offices and carries out some 300 civil and underground engineering projects every year, with “construction timescales up to 30 percent below the industry average,” as the company profile states. In 2007, Köster AG generated sales of around 500 million euro.



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status of projects at regular meetings, and takes real-time decisions on what measures need to be taken to solve a problem.

This organization, which documents its work in a visible manner and thus manages itself, gives Dr. Dieter Köster a degree of certainty that he has long been looking for. As a general contractor, he carries a great risk in a business in which margins are becoming ever smaller and deadlines ever tighter. “The construction industry produces things

too expensively and generates an inferior level of quality at too many interfaces,” is Köster’s assessment. He once tried to do something about it by introducing project cost control, but employees failed to consistently use the instrument intended to keep costs in check and provide protection against unwelcome surprises. Due to the decentralized structure of the company, the boss was too far away from everyday operations on the ground. Delays and problems were often identified too late at company headquarters. These problems could only be rectified at great expense.



A worker (left) hard at work: In Lufthansa-Technik's new hangar, the fitting of new heating, ventilation, sanitary and electrical systems is beginning

This is why Köster AG began to work with Porsche Consulting over a year and a half ago. The consultants led by principal Jörg Kaiser and project manager Jörn Steinbeck conducted a comprehensive analysis right along the supply chain – and began to formulate the idea of integrated process management. At an initial workshop, managers from all sites were taught the principles of lean management, in order to take account of the decentralized structure of the company. They then worked together with the consultants to define the mandatory order-handling process. This cre-

ated the basis at Köster for the implementation of further changes. As Jörg Kaiser says, “Only once I have a stable overall process in place am I able to gradually optimize the individual steps.”

As a result, the expectations at Köster are just as high as the level of dedication. In reference to the world's second-highest mountain, the project with the goal of making the continuous improvement process a lasting success is called “K-two;” it is under the direction of Theodor Wilken. ▶

**Construction site at Hamburg Airport – working in stages:**



**Stage 1: 3rd level left** ■ Dry walls are set in place



**Stage 2: 3rd level right** ■ Dry walls finished on one side ■ Floor finish laid

Trade flow staged in short cycles

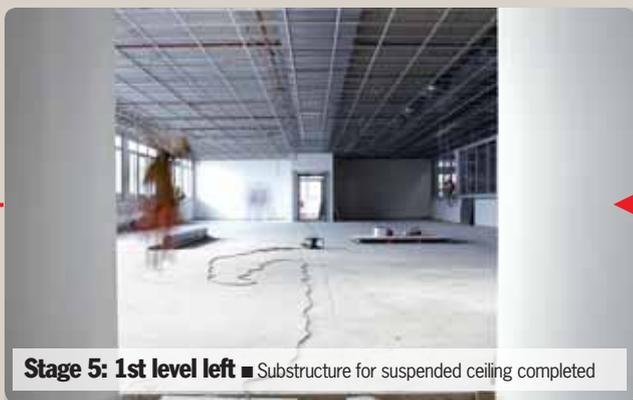


**Stage 3: 2nd level left** ■ Building services installation commences



**Stage 4: 2nd level right** ■ Basic installation of building services completed

Trade flow staged in short cycles



**Stage 5: 1st level left** ■ Substructure for suspended ceiling completed



**Stage 6: 1st level right** ■ Fitted carpet laid

**Planning restrictions for a lean deployment of different trades**

- 1. Define separate construction phases which are as short as possible
- 2. Adapt the required trade capacity to the specified amount of time allocated (ideally one team of tradespeople per indoor unit)
- 3. Carry out short-cycle target-performance comparisons in relation to quality and deadline (ideally on a daily basis)
- 4. The construction section is handed over to the next team of tradespeople in a clean state with no materials left behind



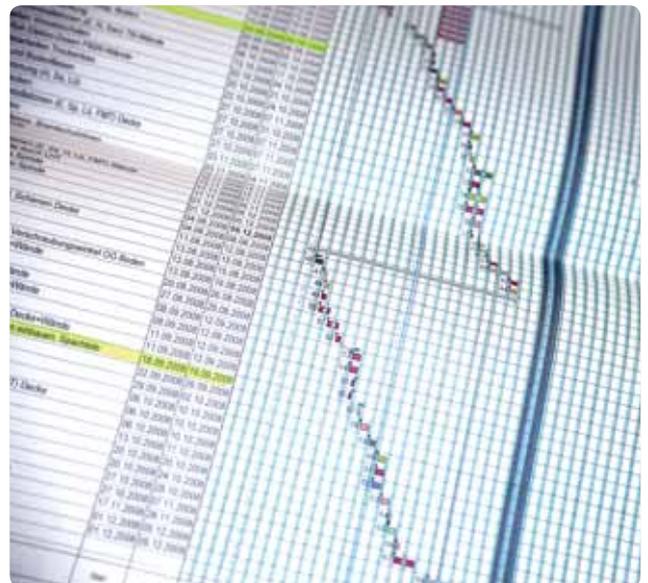
On-site meeting: Köster site manager and subcontractors determine the level of progress with the aid of the cycle management board

He has assembled exceptional employees from right across the company in the K-two organizational team, in order to “pool knowledge and make it useful for everybody”. The team assesses the individual process steps and decides which step should be optimized. Following analysis, training and a final pilot phase on the construction site, the board decides on whether to introduce the improvements, which have been developed and trialed, right across the company. The changes are finally introduced back into the overall order handling process through the K-two organization.

The level of training required to reach all those involved is huge. Köster has now established a dedicated academy in order to meet the requirements. The training courses, including industry-specific simulations, take place at company headquarters, at the branch offices and, with a practical focus, on construction sites. Some 260 construction site managers alone have so far attended the academy. Jörg Kaiser: “This is a very professional approach.”

Hamburg provides one example: A new production hall is being constructed for Lufthansa Technik on the site at the airport. As at many other Köster construction sites, cycle planning and management were introduced there first. This is a method which is used to stabilize the progress of the construction project, make it more transparent, and ensure that more deadlines are met. For this purpose, the construction project was broken down in a manner similar to what happens in automotive production: into the smallest possible service delivery segments, within which the various trades must always carry out their work in the same sequence. On this basis, the time required for the respective work steps was defined, and the processes harmonized.

Visualization also provides the necessary level of overview. The key indicators determined are displayed on the so-called cycle control board, hung so that everyone can clearly see it. Construction site managers and contractors meet daily at this overview to discuss the status ▶



Bit by bit: Short cycles define the schedule



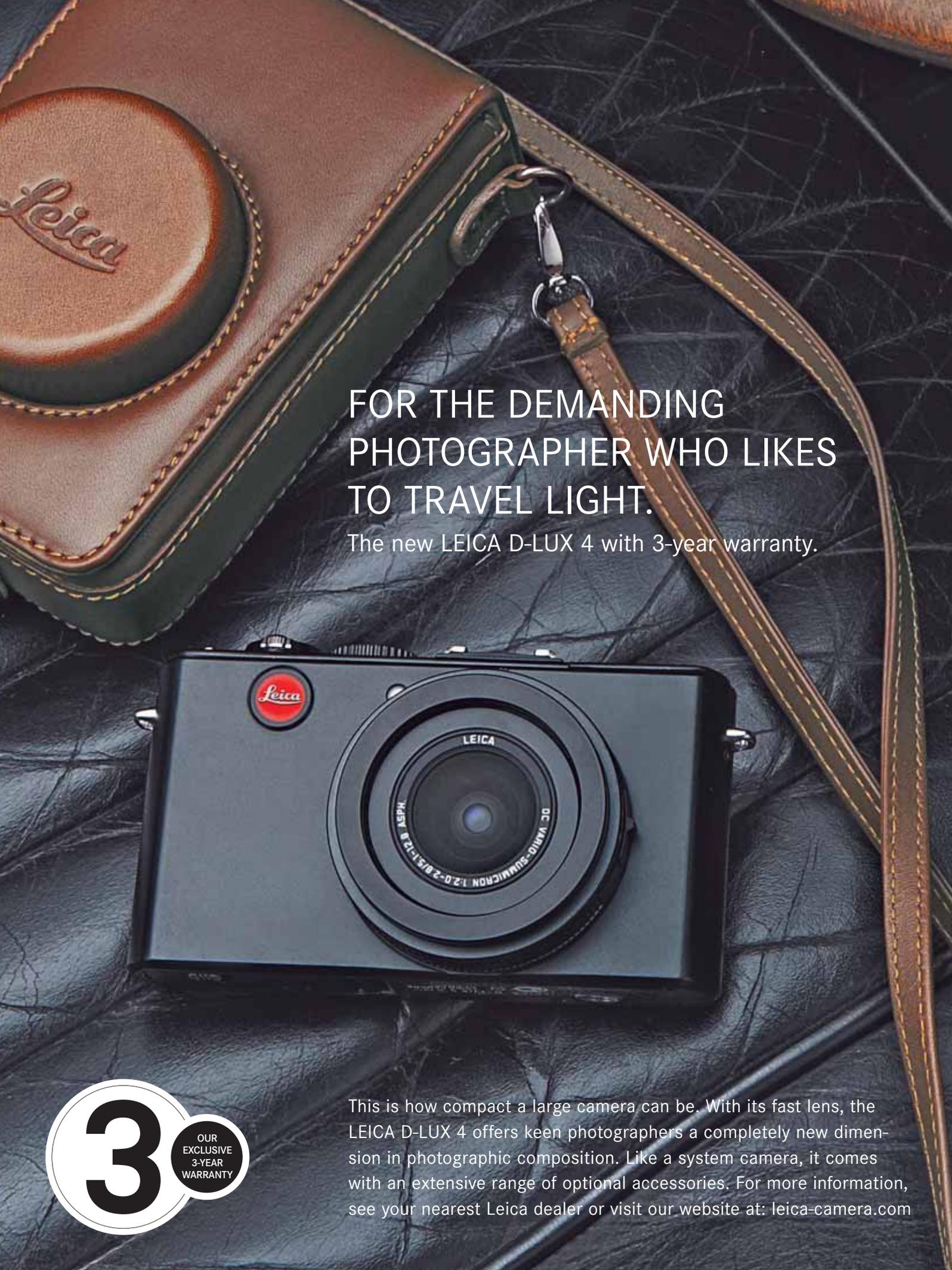
Theodor Wilken, Dr. Dieter Köster, Jörg Kaiser (left to right): Fewer conflicts and more motivation among workers on the construction sites

of various cycles. This is where possible deviations from the plan are discussed. The advantage is that an instant response is possible on site. Jörn Steinbeck says: “The harmonized processes and the management of short cycles provide the team of workers on the construction site with a much better overview of what is going on, and give them confidence.”

Moreover, this new procedure has allowed further key quality assurance indicators to be extrapolated and introduced: the percentage deviation from the plan, the contractors’ ability to meet their delivery deadlines, and the index for order, cleanliness and health and safety at work. The system is having a lasting impact, and coming full circle. Contractors are now checking how their services are rated for themselves. Jörg Kaiser notes:

“Everyone wants to get the green light.”

There has also been an improvement in efficiency. The analyses had revealed that tradesmen were only spending about 30 percent of their time on activities which added value. By contrast, they wasted much more time searching for materials or moving aside excessively large levels of stock. Thanks to the harmonized processes, there are now plans to introduce just-in-time principles. The lean experts place their trust here in what are referred to as the “5 Rs:” In the end, all tradesmen should have the right material available to them in the right quantity, with the right quality, and at the right place and the right time. The next step would then be to optimize the material procurement process: In order to reduce levels of stock stored on a construction ▶



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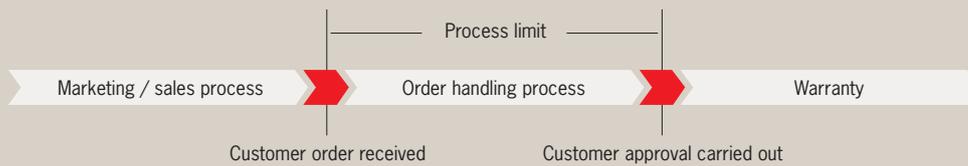


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## Key elements for a professional CIP in construction engineering

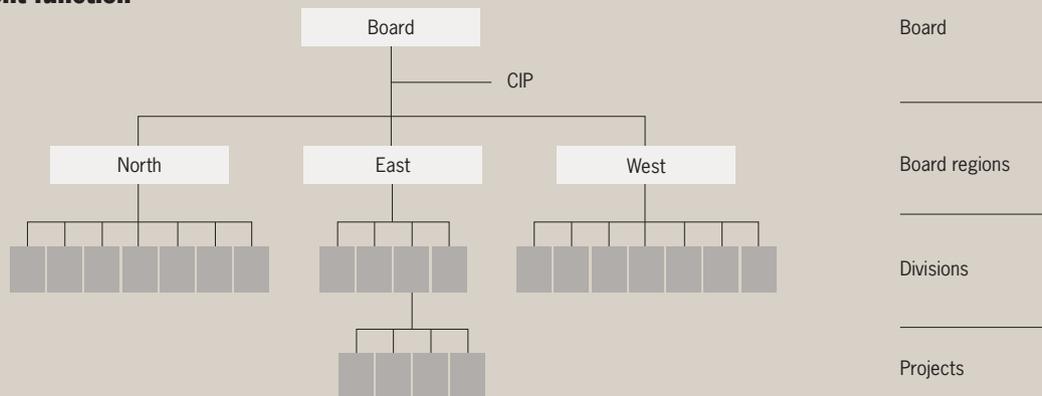
### CIP optimizes all aspects of the OHP

Definition



### CIP organization as a corporate development function

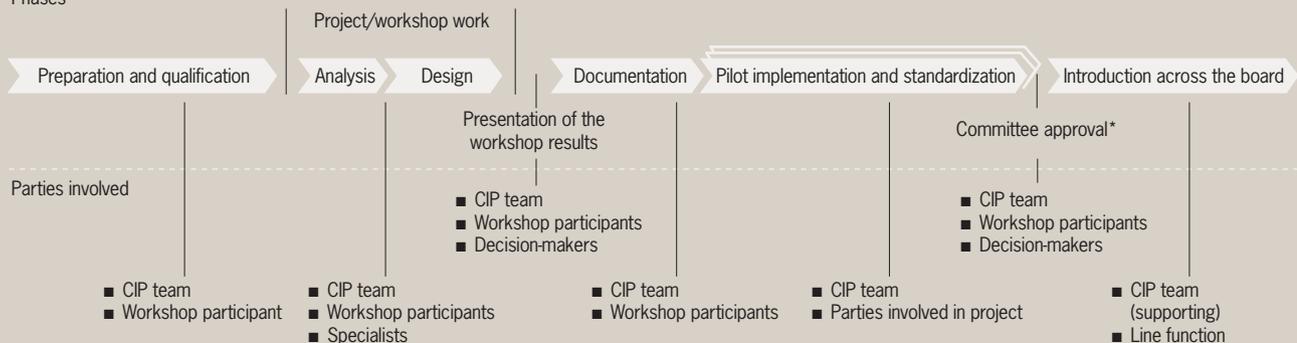
CIP organization



### Standardized CIP sequence

Procedure and parties involved in the CIP

Phases



\* The standards may also be approved in parallel with the pilot project



Mind game: Porsche consultants are part of the construction site team

site, contractors should then deliver smaller quantities at more regular intervals.

For Theodor Wilken, the radical restructuring has long since made its mark. “We still need to convince a lot of people. But our employees are noticing that we’re having fewer conflicts on the construction sites, and that the transparency is there. Motivation levels have risen considerably.” He outlines one of the key things he has learned: “The additional work we now put into production scheduling definitely pays off down the line.”

Köster AG will thus continue to follow the path it has chosen. The K-two organization has already set about optimizing further processes. The focus is always on improving efficiency in construction projects. Dr. Dieter Köster’s plan envisages that by 2010, around 60 percent of all processes with an impact on production should be changed. His aim: “When the consultants leave, we will be a completely different company.” ◀

# Caracho

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