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Businesses in all sectors are under pressure, with managers or shareholders all demanding the same thing: You need to be faster, better and more profitable.

That's why, in this issue of Experience, we want to highlight various aspects of software engineering that contribute to achieving this goal.

The first article answers the question «what type of organisation is the most effective?», while also illustrating how the correct use of agile methods can increase effectiveness within organisations.

Article two considers effectiveness from a business perspective: «How can limited IT resources and other resources be used to achieve maximum output, and how can key aspects and requirements such as ‹usability› be integrated into IT projects from the outset?»

The second part of Experience looks more closely at efficiency. The third article deals with finding an appropriate tool to provide optimal support to the development organisation: «What issues should you focus on to ensure there is no uncontrolled growth in your tool environment, while at the same time meeting your requirements in the most effective way?»

In the fourth article, you can read more on the subject of knowledge, because rather than constantly reinventing the wheel, being effective is about creating, sharing and using organisational knowledge efficiently.

I hope that you enjoy reading this issue!

Best wishes,

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WANTED: FUNCTIONAL, AGILE FORMS OF ORGANISATION

Agile methods can only succeed if the whole organisation is involved

Agile methods offer a great deal of potential. To ensure they are fully effective, companies must employ the methods on a comprehensive basis — from the CEO to the developer.

BY CHRISTOPH AESCHLIMANN
AND BRUNO HEUFELDER

All organisations want to work effectively and efficiently. Agile methods for project management and software development, such as Scrum, are not only a key talking point but are also gaining more of a foothold within companies. And it's no wonder considering they promise everything a company dreams of, including greater flexibility, lower costs and faster implementation of projects, while still allowing for individual features and modified conditions. Problems in development are identified and rectified at an early stage and there are no long, detailed planning stages; instead, it's a «sprint» to the final goal. In other words, they make a company agile.

The number of Scrum users is growing all the time, but after the first wave of motivation for trialling these methods has passed, some companies are feeling a certain amount of disappointment. At least some of the expectations for agile methods have not been met. The reasons include:

- Lack of distribution throughout the company: Scrum is commonly used at the base level of software development, while managers work with agile methods less frequently, preferring instead to use detailed planning methods.

- Inadequate definition of Scrum roles: The Scrum methodology provides clearly defined roles, which, in practice, are often implemented incorrectly. For example, a central role that is frequently neglected is that of the «product owner», who is essentially a customer of the specialist department. Many projects simply go ahead with a conventional project manager and do not appoint a «product owner» with the appropriate expertise.

- Lack of coordination: Scrum is implemented in individual areas but there is a lack of coordination between users/ teams. Above all, this contradicts the agile concept of continuous prioritisation. It must also be clear who is doing what so that the «sprints» – a defined cycle of iterations – can be maintained.

- «Dilution»: Many companies would claim that they use agile methods, but the majority of them mix elements of their existing approach with elements of agile procedures. It is therefore rare to come across a «pure» agile approach. Instead, it is more common to find agile hybrid models that combine multiple methods – and not always in a coherent fashion.

- The cure-all: Scrum is often seen as a «cure-all» for every type of problem. But unfortunately, when the method needs to be applied within a large and complex context, Scrum frequently leaves a vacuum behind. In this case, for instance, far more than three Scrum roles are required to ensure optimal cooperation.

The importance of an integrated view becomes clear in large, complex projects that are conducted on a long-term basis and involve a large number of project

«All hierarchical levels must think and act in an agile way so that the enormous potential of these methods can be exploited.»
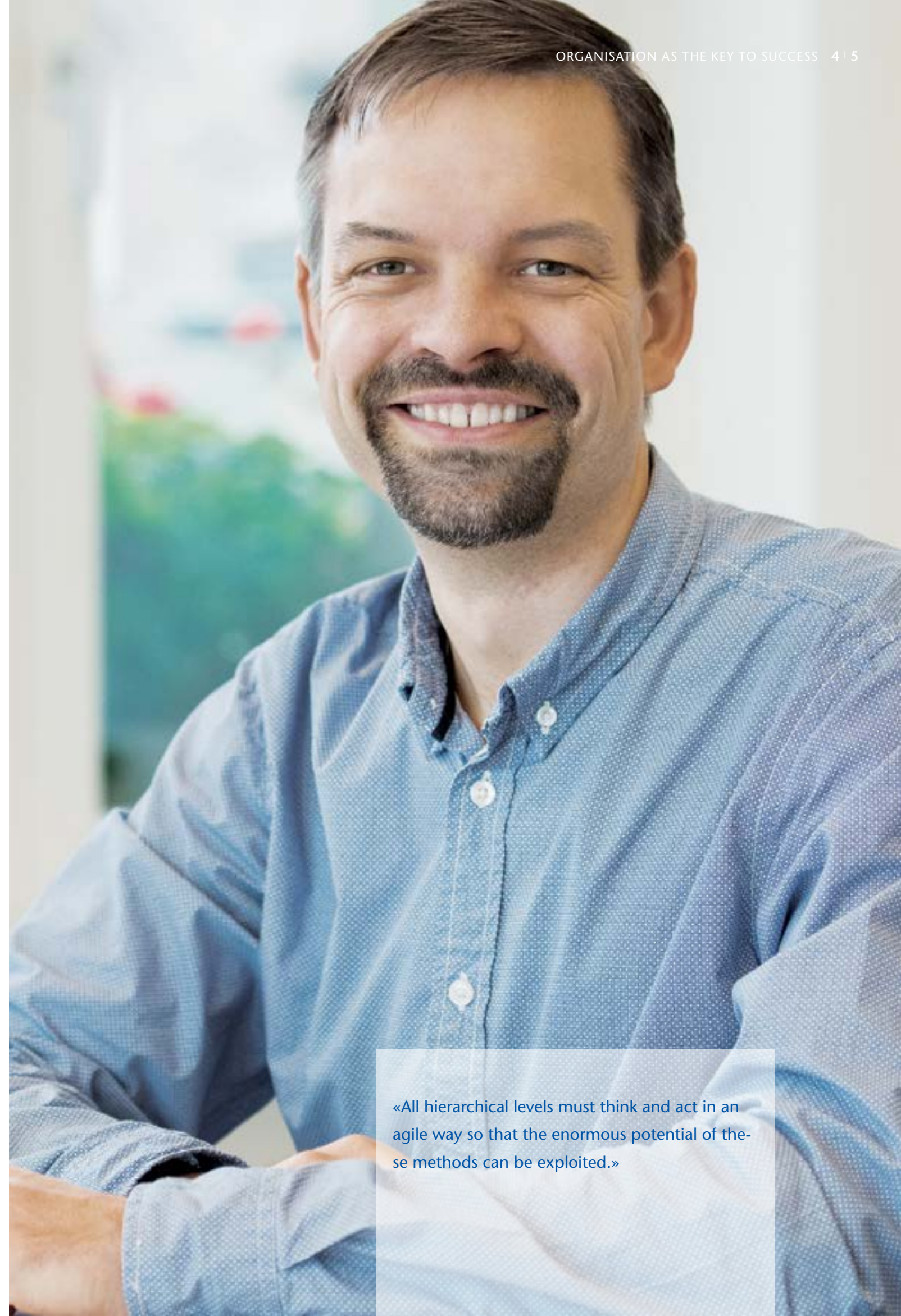
staff: Projects of such size and complexity are often difficult to manage using a conventional approach. It is particularly difficult to deal with changes to requirements or errors in the design. Agile methods prioritise change and a process of constant improvement, with the aim of achieving quick initial results that can then be examined and improved still further. In such projects, companies usually reach their limits due to a lack of comprehensive agile methodology that standardises the approach taken by the project team and at higher levels of the company.

But there is a solution: To exploit the potential of agile methods in a larger organisation, the implementation of the «Scaled Agile Framework» is recommended. This allows the agile approach to be integrated into the entire organisation, which would still require a change in thinking across all levels of the company.

The «Scaled Agile Framework» developed by the agile experts helps compa-

nies to organise their product development in an agile way across the different levels of the organisation. The defined levels are the team, programme and portfolio levels. The typical Scrum development is implemented at the team level, while planning and supervision for this implementation take places at the programme level. At the portfolio level, the significance of the programmes to the corporate strategy is set out. The inclusion of these three levels ensures that tasks are prioritised and implemented in line with the corporate strategy.

In practice, aligning an entire company with the agile concept overnight is a virtually impossible task. But if the vision and intention to be an agile company are ingrained in the organisation and strategy, then this is an important step in the right direction. From that point onwards, the agile approach should continue to be spread throughout the company. The following example clearly illustrates how isolated Scrum activities in

a reorganisation project at an IT company were expanded successfully across the entire software development process. The procedure was expanded to include individual coordinating elements in order to manage the complexity of the projects.

Example
GROWTH ALONE IS NOT ENOUGH: WORKING WITH AN AGILE AND SCALABLE APPROACH

First, the good news: In just one year, the software development organisation at an IT company has doubled in size thanks to an excellent order situation. However, due to a lack of space, the team, which works according to the Scrum agile method, has to be split over two sites.

It quickly becomes clear that the previous processes and form of organisation are no longer suitable for the bigger, divided team. There are inefficiencies due to a lack of internal coordination. The development process and its standard tools are no longer implemented consistently. Several sub-teams work with Scrum but targets are not met because implementation is isolated rather than being standardised across all teams. The company believes that its software development could become more streamlined and cost-efficient, so it enlists external support to set up a project team to examine the development organisation and its working methods. The first analysis phase involves interviewing developers and their internal customers, and analysing processes and development orders. An informed analysis is used to describe the current level of maturity of the development organisation

and present it in a simple, visual way – providing an excellent basis for managerial decision-making processes. In the second step, the project team draws up a target state for the development organisation, which establishes the comprehensive application of Scrum as the development standard and stipulates that the organisation should be prepared for further growth in the near future. The areas with optimisation potential derived from the actual analysis are added to the potential improvements identified in a comparison of the actual and target situation.

Using this information, the project team plans the implementation phase, developing an «improvement roadmap». The key question is: «Can this be implemented quickly and easily, and is this procedure realistic?» After all, the company wants to receive viable suggestions for improvement that can be implemented as quickly as possible at a reasonable level of resource expenditure.

In just a few months, the IT company successfully implemented a range of measures, including the following:

- Standardisation: The actual analysis identifies the two project types that occur most frequently in the company. A basic, standardised process for software development is put in place for these two project types. The understanding of roles is also improved, in particular those of «product owners», project managers and project sponsors.

- An all-Scrum approach: It is ensured that all teams in a programme use Scrum in the same way and that any challenges are tackled across teams.

• Technology board: This newly created steering group is made up of several virtual teams, each responsible for a particular technology. This means that they are responsible for ensuring that all sites are using the same technology and that tool support *(requirements management, traceability, test management, source control, incident management, continuous integration platform, etc.)* is managed correctly. They also ensure that the different technical architectures are integrated and that existing components are reused. In addition, they make sure internal training is provided in selected technologies and act as internal experts on these subjects.

• Capacity planning: Cross-location capacity planning is introduced, in which capacity utilisation is planned and all employees are included so that the development organisation's resources are used as efficiently as possible.

One decisive factor for the success of the new organisation was the understanding of all those involved *(right up to managerial level)* of the current situation in software development – a result of the comprehensive analysis phase. Change management also guided the company to its goal: The development organisation was integrated into the process so that the staff and stakeholders involved understand what triggers these changes and why they are necessary. Support from managers plays an important role in this regard. A compelling vision or a target state are essential for ensuring the necessary motivation, so that all those involved stay focused on the ultimate goal during implementation.

Shorter development times, fewer complaints and optimised costs during software development have made the project a long-term success for the company.

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«When it comes to agile methods such as Scrum, companies are facing a kind of second wave: Once the first agile projects are completed, the agile working methods must be introduced across the organisation as a whole.»

ACHIEVING MAXIMUM ADDED VALUE WITH LIMITED RESOURCES

Getting closer to your end users helps you save time and money and ensures you do the right things from the outset

«Usability» is often over-looked during software development. By taking the right approach, any company can quickly and easily put the spotlight on its future end users — and in doing so, form long-lasting relationships with them.

BY CARLO CRONAUER, SASCHA NUSSBAUMER AND GABRIEL SALM

«Usability» is an issue that has become more and more important in software development over recent years, particularly in relation to direct end-user interfaces. This is because an attractive and user-friendly interface is not only an essential mark of quality that makes a company stand out to its end users, but also impacts on brand positioning and brand recognition.

Appropriate models and approaches are available to help ensure that the needs of end users are taken into account during the development phase; these include the «user-centred design» approach, which focuses attention on the end user from the outset. In a similar way to the agile approach, short cycles and feedback loops constantly collect user feedback and then adapt the product accordingly.

The various criteria that define «usability» are defined in an ISO standard. The five key criteria in this standard are:

1. Suitability for the task: The user interface only shows the things the user really needs to complete the task, with the focus on effectiveness and efficiency.

2. Self-descriptiveness: The concepts used are understandable for end users and the interaction process is always transparent.

3. Conformity with user expectations: Consistency is guaranteed within the system and with other systems.

4. Controllability: Users can always control the interaction process.

5. Error tolerance: In spite of errors, the objective can still be achieved by making minor corrections.

There are also two more criteria that should be applied as far as possible: suitability for learning and suitability for individualisation.

The two following examples clearly demonstrate how the «user-centred design» approach can be successfully applied.

Example 1
DOING THE RIGHT THING MEANS PRIORITISING THE RIGHT WAY

Facing a lack of requirements, out-dated functions and interfaces, and high maintenance costs, a transport company wants to replace its existing supply and capacity planning system with new technology. The new platform should also offer utilisation forecasts, taking into account data from major event organisers. To make the investment profitable, the new tool must be substantially more efficient than the previous solution.

Although the rough concept was designed according to the waterfall model, the de-

«If you put the issue of ‹usability› in the spotlight from the beginning, you will save on costs in the long term by having fewer work steps, fewer change requests and a more satisfied end customer.»
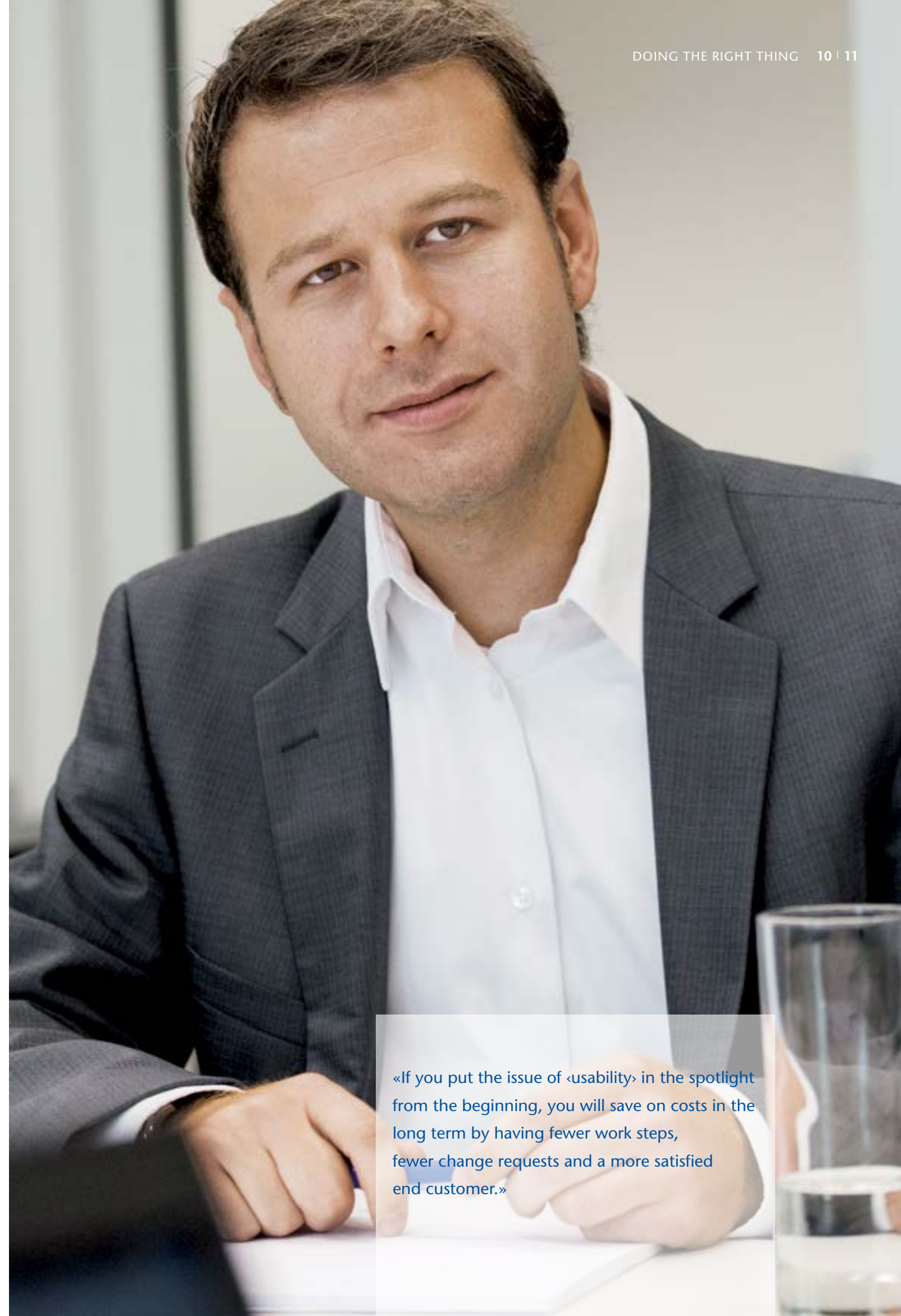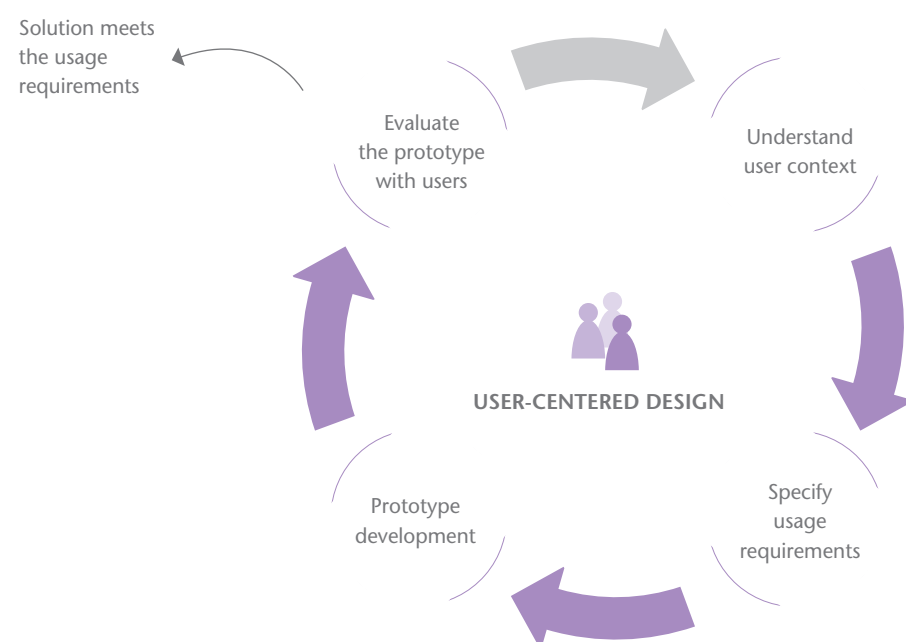
tailed concept phase and the implementation phase must be combined and executed in an agile manner with Scrum for time and cost-related reasons. This is due to dependencies such as old interface systems, which mean it is imperative that the replacement is carried out on the scheduled date.

The technology consultancy company supporting this project placed an emphasis on two basic principles of the agile work approach: considering feedback from actual users as early as possible, and prioritising tasks that will bring the highest and most long-term added value to the business *(see Fig. 1)*.

Although the switch from the waterfall method to the agile approach is initially quite difficult, results can be quickly achieved with the help of Scrum experts from the consultancy company. The key success factors and lessons learned from this project are as follows:

- Appropriate methodology: The different Scrum roles, described in the first article, are not only applied correctly in the project, but are also assigned to individuals with the necessary skills.

- Objective prioritisation: When using agile methods, the business should continuously prioritise the functionalities *(«user stories»)* of the tool in development. This involved asking such questions as: «What provides the business with the biggest added value?» or «What do other important functions depend on?» Initially, everything in the company was given high priority, making productive implementation impossible. The consultancy company therefore developed an objective criteria cat-
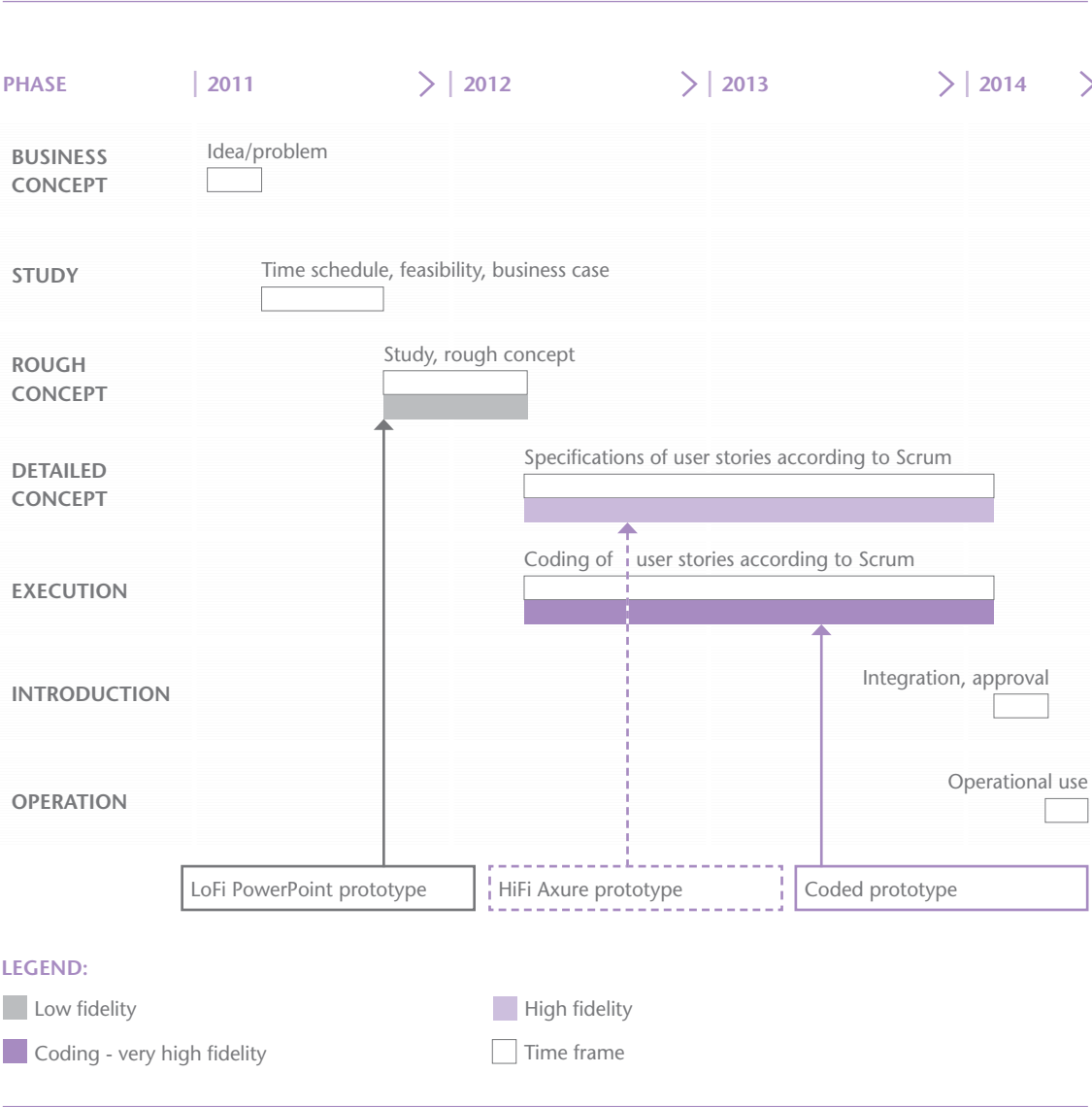
alogue to assess the functionalities in terms of their relevance to the business.

- Cost-effective prototype development: In order to keep development costs and, in particular, the cost of subsequent modifications as low as possible, prototypes are implemented using the most basic of resources, such as a drawing in PowerPoint. These prototypes are then coordinated directly with specialist users, who can give feedback on the graphic representation of the user interface at this early stage. The prototype is only implemented by the software development team once it has been developed to a sufficient standard.

- Correct use of tools: A team of experts specialising in «usability» supports the project and introduces the «user-centred design» approach. In this case, the project team involves the future users in the specialist departments on an ongoing basis by means of workshops and interviews, ensuring that the new system meets the customer's expectations and provides real added value when compared with the old solution *(see Fig. 2)*.

By using the appropriate methodology in the Scrum approach and developing the criteria catalogue for prioritisation, the project remains transparent for the company at all times. As a consequence, any changes or new commercial requirements can be quickly responded to. The ultimate aim is to select the appropriate or most effective approach in every instance. By involving end users, many errors can be avoided and the added value for end users can be increased. Other success factors include the cost-effective development approach and the introduction of the «user-centred design» model.

FIG. 1: EARLY USER FEEDBACK THROUGH USER-CENTERED DESIGN

Solution meets the usage requirements

Evaluate the prototype with users

Understand user context

USER-CENTERED DESIGN

Prototype development

Specify usage requirements

FIG. 2: COST-EFFECTIVE PROTOTYPE DEVELOPMENT THROUGH PHASE-SPECIFIC FIDELITY

PHASE	2011	2012	2013	2014	

BUSINESS CONCEPT — Idea/problem

STUDY — Time schedule, feasibility, business case

ROUGH CONCEPT — Study, rough concept

DETAILED CONCEPT — Specifications of user stories according to Scrum

EXECUTION — Coding of user stories according to Scrum

INTRODUCTION — Integration, approval

OPERATION — Operational use

LoFi PowerPoint prototype | HiFi Axure prototype | Coded prototype

LEGEND:

- Low fidelity
- Coding - very high fidelity
- High fidelity
- Time frame

By taking the right approach, any company can quickly and easily put the spotlight on its future end users — and in doing so, form long-lasting relationships with them.

Example 2

SOFTWARE — FROM A BY-PRODUCT TO A DISTINGUISHING FEATURE

For a manufacturer in the field of measurement technology, its core competency lies in the «hardware» it produces. From the point of view of the company, the software needed for each product has long been seen as something of a «by-product». This view is changing, however, with one reason being the ever increasing requirements of end users when it comes to the «usability» of software solutions:

- The software must offer an impressive level of quality for the company to maintain its strong market position into the future. After all, this software *(or the «user interface»)* is a direct interface to end users, because it is often the case that the actual products *(the hardware)* are not visible to the user.

- From a branding point of view, products in the international market must have a high recognition value that should also be reflected in the software or user interface.

- Software development should be faster and more efficient so that products can be brought to market in a faster and more cost-effective way.

As part of the «user interface» modernization, «usability» is becoming the new main criterion in product development.

As the project includes product categories from multiple divisions, the different expectations and requirements of end users must be gathered and grouped in terms of «the lowest common denominator».

Since the company has neither the capacity nor the necessary expertise in the field of «usability», the technology partner, which will also take on part of future software development, provides support in such tasks as developing the «Corporate Software Style Guide». These guidelines set standards for user-friendly software development, while also ensuring products have a high recognition value and keeping development costs streamlined in accordance with defined standards.

The «user-centred design» approach also features in this project: Workshops and interviews with various key individuals are used to examine the software's user interfaces, designed in accordance with ISO standards, on a continuous basis to ensure they are user-friendly.

The team of experts had no direct access to end users as the company's customers are distributed around the world, so end customers could only provide their input on «usability» via questionnaires, which evaluated the graphical user interfaces. And as the standards in the «Corporate Software Style Guide» set out the basic principles for several product categories, there is no «one single user». This is what makes interviews with those key internal

individuals who are in direct contact with end customers so important.

The team in this practical example also frequently works with drawings that are later used as templates by the professional graphic designer. This approach ensures that initial interfaces are produced and tested in a cost-effective way before being introduced to the considerably more expensive software development process.

To further standardise and streamline the software development process, the «Corporate Software Style Guide» also includes very precise visual icons specially designed for the customer. These icons are used again and again in the software in a wide range of product categories. Consequently, these icons do not have to be redeveloped and reprogrammed time and again, and they are also easily recognised by end users thanks to their special design.

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«‹Usability› is not expensive. The wishes and needs of the end user can be met using the simplest resources, be it a questionnaire, a short interview or a one-hour test of a prototype».

EFFICIENT SUPPORT FOR SOFTWARE DEVELOPMENT

One universal tool or several specialised tools? There is no definitive formula to solve this dilemma

If companies do not specify the tools used to support product development central-ly, then this can cause un-controlled growth in the tool landscape. Finding the right tool for completing tasks requires a stocktaking process and requirements analysis – an approach that certainly pays dividends.

BY MATTHIAS KÜNZI, MATEUSZ KASPRZAK AND CHRISTIAN VETSCH

An organisation's efficiency is reflected in the systems and tools that it uses. Those responsible for these tools frequently ask: «Is it better to use one tool for all tasks or multiple specialised tools?»

There is no single, correct answer to this question. As with so many other questions, the answer usually depends on the individual case and the relevant circumstances. Using one single tool has the advantage of covering multiple functions and tasks while ensuring that no format discontinuity issues or interface problems occur. However, having everything available from one single tool usually reduces flexibility. Specialised tools offer more individualised functions and often provide unrivalled quality in their field. In order to work, they must be integrated into the system environment and will require future maintenance work. Specialised tools also incur the cost of additional license fees.

Instead of using «price» indiscriminately as the sole criterion in their decision-making process, companies should first analyse which tool or tools are suitable for the relevant tasks and for their requirements. It will be beneficial to approach the issue in a strategic and considered way, which means starting with a stocktaking process that answers the following questions: «What process specifications are available for product development? How can these be sup-

ported with tools? Are they sufficiently well defined and documented? What can they do?» The crucial question here is: Should a tool support the existing processes, or should the introduction of a tool refine, optimise or even re-define processes?

«Which functions do I need, both now and in the future?» This last question in particular may involve a considerable amount of work, for example if requirements for different product categories, specialist departments and sites, or even regulatory specifications, must be identified and recorded. But investing in a good concept will eventually result in considerable cost reductions, from purchasing and licensing costs to maintenance and operating costs.

It is important to note that a tool that requires significant retrospective modification to adapt it to a company's needs will cause potential error sources and incur high costs for new releases. The relevant customisations will also need to be modified and tested. All the more reason to pay closer attention to the choice of tool.

Once you have decided on one tool or multiple tools, they must be integrated into the business – or in other words, put in the «heads and hands» of employees. Organisations can only achieve maximum added value once all employees are using the same tools. The second example in this article is a good demonstration of tool integration. But first, let us talk more about taking a professional approach to tool analysis.

«Many companies face uncontrolled growth of tools, creating a lack of transparency and increasing costs. Tasks can often be completed and requirements met much more efficiently with one tool or a small number of tools».
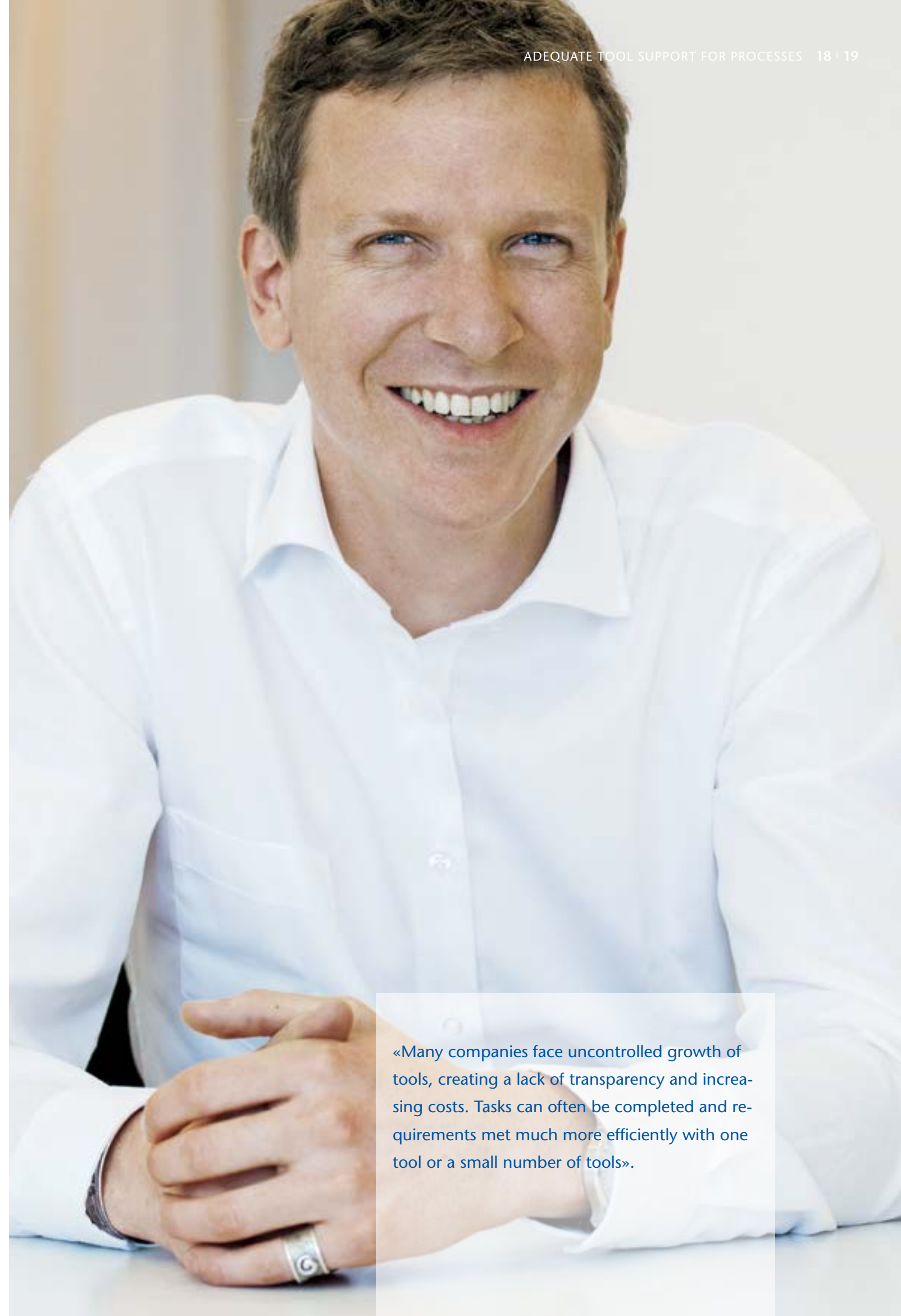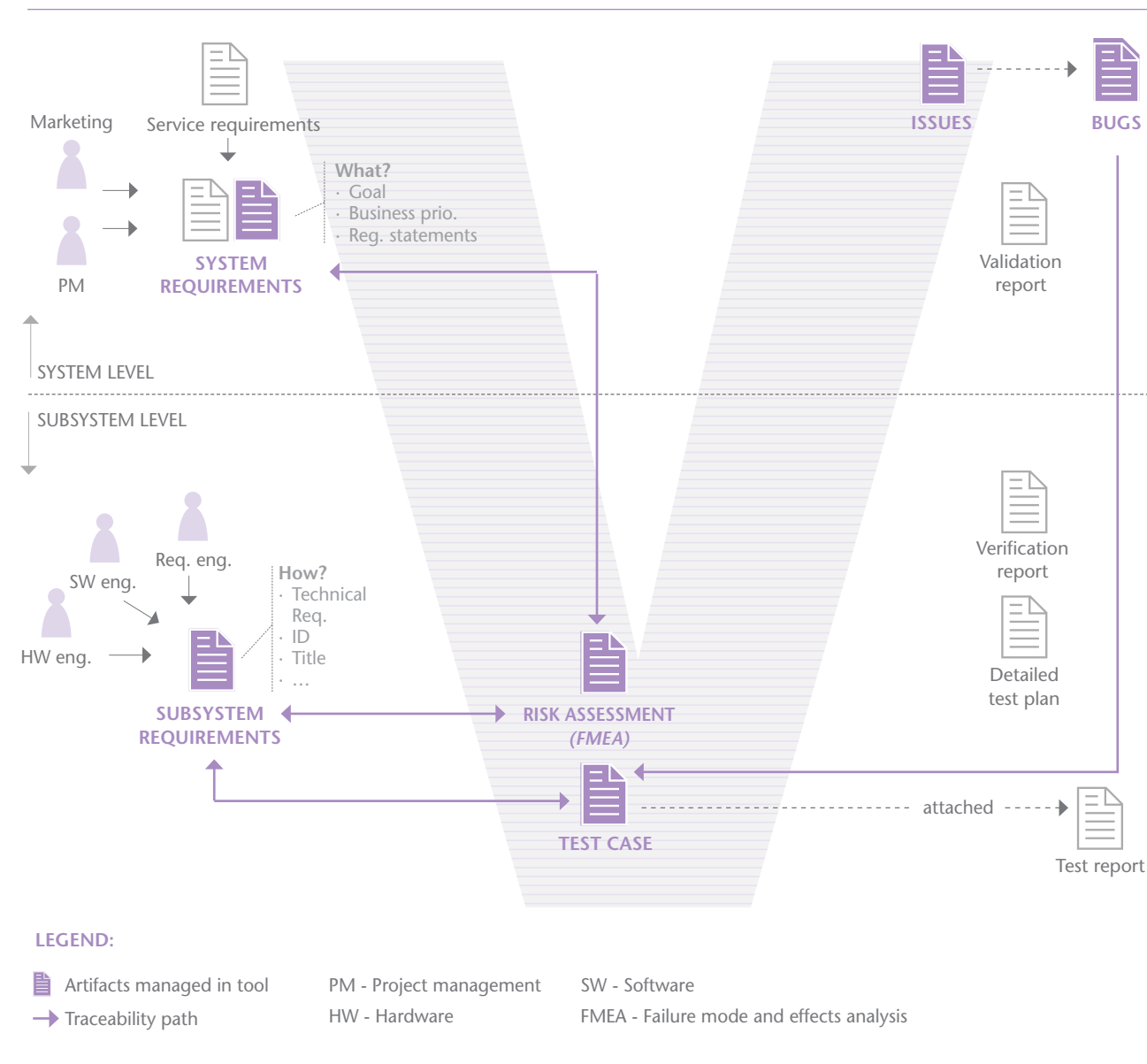
FIG. 3: BIG PICTURE AS A RESULT OF THE FIRST ANALYSIS OF THE CURRENT STATE

LEGEND:

Artifacts managed in tool	PM - Project management	SW - Software
Traceability path	HW - Hardware	FMEA - Failure mode and effects analysis

MANAGING UNCONTROLLED GROWTH – AN ANALYSIS THAT PAYS DIVIDENDS

An international medical device manufacturer wants to evaluate and revise its tool environment in «requirements engineering» for hardware and software development. That's because the company is using a multitude of tools in its different projects, sites and departments. Due to format continuity issues, this has led to problems in verifying traceability, while also creating a very heterogeneous and complex system environment with a lack of transparency and an inadequate overview of costs and licenses etc. Product development has suffered in terms of both effectiveness and efficiency.

As the business also operates in a highly regulated market and in a wide range of countries, the only development tools that should be used are those that meet tough requirements, such as those relating to licensing of new products or audits.

The manufacturer is looking for a partner who can complete an internal analysis regarding the status of the tools being used and their functions. The key questions are:

- Which tools are currently being used for each function and in each division of the company?

- What functions/requirements must a development tool include in order to fulfil tough commercial and regulatory demands and without the company's business operations suffering?

- Where are the overlaps in the existing system environment and what functions are not covered?

- How can the design of the tool environment be made more efficient?

The partner, who has a high degree of technological expertise, an understanding of requirements engineering and experience in product licensing, analyses the existing tool environment within the company using structured interviews *(see Fig. 3)*. The criteria under investigation have already been defined with the customer. The external consultant then uses this information to develop a matrix for evaluating requirements and prioritises these requirements according to the criteria «have», «must» and «should», or in other words: What functions do the existing tools offer, what functions must they offer and what functions should they offer *(see Fig. 4)*.

The next step is to derive areas with potential for optimisation from the evaluation matrix. Various scenarios are used to demonstrate the solutions available for the future. In this particular case, the expert recommends using a single tool to record and manage requirements – one that is already in use in the company and that covers all the necessary requirements across the product's entire lifecycle, from development to maintenance.

For the company, this special project has paid off in many respects. Despite hiring an external consultant, the cost of development tools fell dramatically after the project and greater added value was generated for customers:

- Overview/transparency of tool environment and use of tools.

FIG. 4: TOOL EVALUATION MATRIX - REQUIREMENT ENGINEERING

Requirements engineering			Current usage of the tool	Optimisation potential of the tool	Current usage of the tool	Optimisation potential of the tool
ASPECT	**SOURCE**	**PRIORITY**	**TOOL 1**		**TOOL 2**	
			IS	OPTIMAL	IS	OPTIMAL
Support for a free structuring of product requirements	C	M	++	√	++	√
Support for the specification of a structure *(template)* for the collection of the product requirements *(topics)*	C	S	– –	++	– –	?
Support for a platform-based development *(platform-specific requirements)*	C	M	– –	+	+	√
Ability to capture requirements of different formats *(UML, use case-based, ...)*	C	S	– –	+	– –	– –
Efficient and flexible report generation *(pre-filtered requirements export in Excel and Word)*	C	M	++	√	+	++
Creating a requirements template *(use case diagram, EARS, user story with acceptance criteria, ...)*	C	S	– –	++	– –	?

LEGEND:

C = Customer specified criteria	M = Must	TOOL USAGE		OPTIMISATION POTENTIAL	
B = Best practice	S = Should	– – No	+ Partially	– – No	+ Some
		– Little	++ Frequent	– Little	++ Large

A tool that requires significant retrospective modification to adapt it to a company's needs will cause potential error sources and incur high costs for new releases. The relevant customisations will also need to be modified and tested.

- Evaluation/analysis of tools in use.

- Identification of areas with optimisation potential and risks.

- Structured handling of internal department needs.

The biggest challenge of this project is to prove to the departments and employees who are not yet working with the future tool and are unfamiliar with it that the tool is the right one and will meet all the necessary requirements.

Example 2
INTEGRATING A TOOL IN THE COMPANY THROUGH A TOP-DOWN APPROACH AND PRACTICAL TRAINING

A company has decided to use a standard tool in «Application Lifecycle Management» that completes all tasks from defining requirements and tracking test cases to planning and managing new releases. The tool even records any technical issues. The reason for choosing this tool was that it covered the complete lifecycle, thereby preventing any format continuity problems. At the same time, the company loses a certain degree of flexibility and must first invest in training for its employees.

That's why the company is looking for a professional partner who understands the tool and can provide expertise in training and methodology, so that a large number of employees can receive professional training in how to use this tool.

The following distinction provided another reason for bringing an external service provider on board: If the induction and training for using the tool is undertaken by an external company, then this company does not have to justify the original decision to use the tool, like an internal employee would. The external service provider can concentrate instead on offering its support and expertise in the tool. The objective of this task is to introduce the new standard tool and demonstrate the benefits it offers, as well as to help employees understand that the more people use the tool, the more efficient this is for the organisation.

The major challenge lies in designing the training in such a way that employees get real added value and are able to use the tool themselves afterwards. That's why the specialist tasked with providing the training uses a test project that has been specially developed for the company.

At the very beginning of the project, the responsible trainer recognises that the employees' thoughts and concerns regarding the new tool must be actively addressed. To ensure that those affected by the process are also involved in it, the trainer gathers the different problems

faced by the attendees in their everyday work; practical solutions to these problems then need to be found during training. The trainer also develops a list of reasons for using the tool and uses this list consistently at the beginning of each training session.

As the training is designed and planned effectively, over 40 people can be trained to use the new tool each month. Once training is complete, the attendees are immediately able to use the new tool, meaning it is integrated in the company for the long term. There is a positive effect on the company's accounts too, despite investing in analysis and training: lower costs and a leaner, more agile tool environment, with no uncontrolled growth, that meets the company's precise needs.

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«To integrate a tool effectively in a company, a decision must be made at a central point and this decision must be implemented consistently.»

EFFICIENT WAYS TO EXPAND AND MANAGE KNOWLEDGE

Special concepts and methods can help to make knowledge finally visible

Knowledge is an important asset. That's why companies take a great interest in making knowledge accessible over the long term. Nevertheless, as a result of employee turnover, they are constantly faced with the challenge of transferring knowledge — or building it up from scratch again.

BY PETER ZUBER AND RETO ZUMBÜHL

In our information society, knowledge is the most important production factor and the basis of innovation. If an organisation wants to develop, it must first of all identify the extent of its knowledge so that it can make it accessible to its employees as widely as possible and on a long-term basis.

Companies are confronted time and again with situations relating to the identification and transfer of knowledge: They may arise when gaps in knowledge are identified, or elements of specialist expertise that are entirely absent from the company and need to be built up from scratch. Or knowledge may be lost as a result of natural employee turnover, or when relocating or combining teams or entire sites, or due to outsourcing.

Once the gaps in a company's knowledge have been identified, project-based coaching is often an effective and efficient solution for building up any expertise that it lacks. This newly acquired knowledge is then put to best use by employees in a specific project, ensuring it is integrated into the organisation in the long term. In this case, it is crucial to choose the right people for the coaching: Clearly, they must play a role in the project so that they can learn from the practical example. They must also be open to further development and coaching, as shown in this article's second practical example. In addition, a professional coach is required with the required skills in the field and personal coaching experience.

When a company passes on its existing knowledge to other employees, this is known as knowledge transfer. The theory states that knowledge transfer involves three building blocks of knowledge management: identification, acquisition and distribution of knowledge *(see Fig. 5)*.
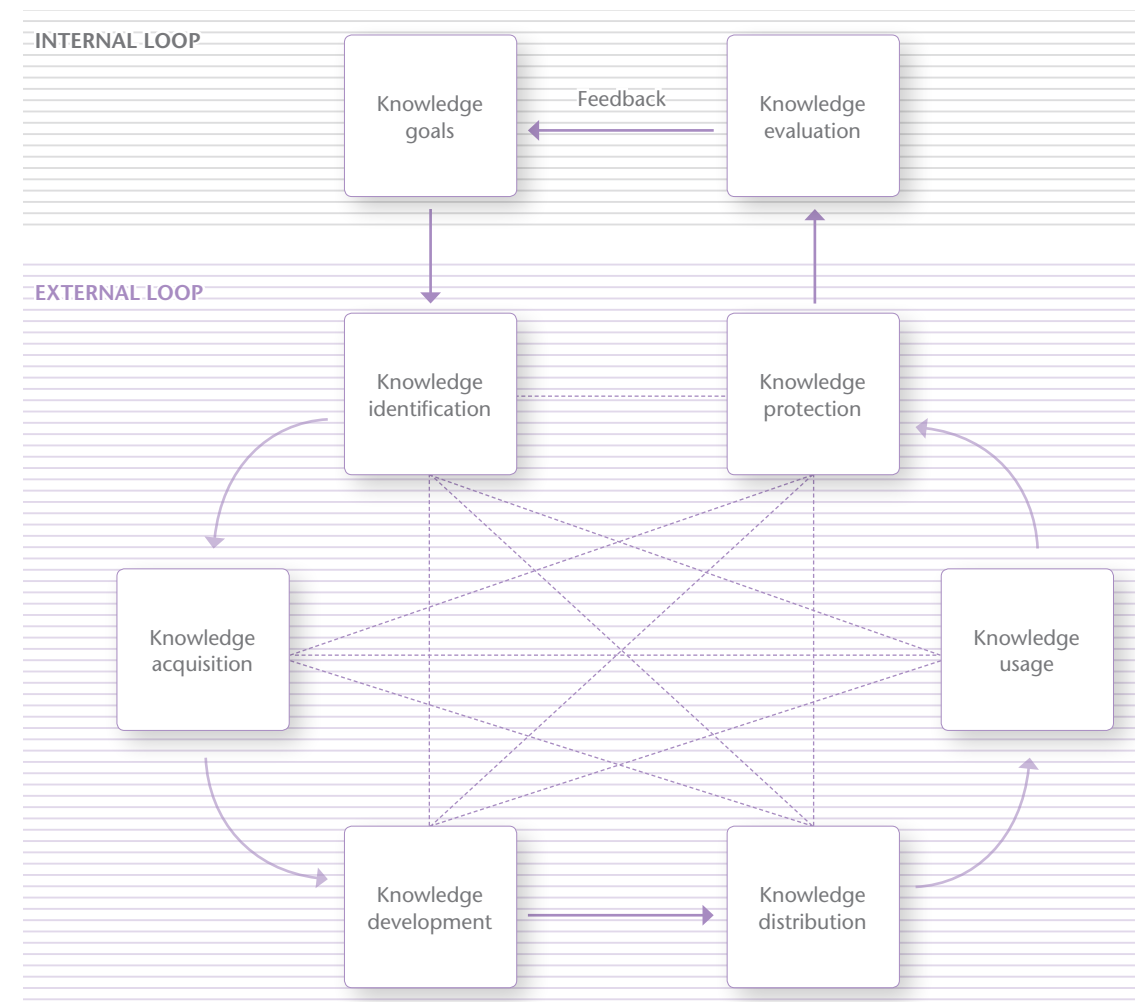
A knowledge transfer plan should prioritise the following aspects:

- What fields of knowledge are involved? What is being transferred?

- What techniques and tools are used to highlight the information that is known and the information that is unknown?

- Which employees are involved in the knowledge transfer?

- What is the current level of knowledge of each individual employee?

- How motivated/committed are the affected employees as active members of this project? Does the change process need to be managed, or are specific techniques required?

- Who is responsible for the individual fields of knowledge?

- How is the schedule and the content planned?

Whenever people come together to discuss, plan and work on issues, visualisation methods are useful supporting tools. The concept of «knowledge maps» helps

«If knowledge must be transferred, a company must find suitable methods and techniques that actually visualise the knowledge held by its employees. We use over 30 different instruments for this purpose in our consultancy practices.»

FIG. 5: CONCEPT OF KNOWLEDGE MANAGEMENT *(PROBST, RAUB & ROMHARDT)*

INTERNAL LOOP

Knowledge goals

Feedback

Knowledge evaluation

EXTERNAL LOOP

Knowledge identification

Knowledge protection

Knowledge acquisition

Knowledge usage

Knowledge development

Knowledge distribution

LEGEND:

The eight blocks form a linked management control loop. It is important to ensure that all components are considered equally. Many problems result from an isolated optimisation of single core activities.

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to identify any knowledge that is lacking, and to structure and plan complex knowledge transfers. This concept also makes deliberate use of metaphorical language, with, for example, the application of *«(knowledge) continents»*, which in turn are grouped into «country maps».

sultant and support the project from a change perspective. In addition, sensitivity is required when dealing with the experts at the original location: The company needs them to be actively involved in a professional handover, so that as little knowledge as possible is lost during the change of location.

Example 1
USING THE RIGHT TOOLS TO VISUALISE KNOWLEDGE AND TRANSFER IT SUCCESSFULLY

A system development company has opted to close one of its sites and transfer its development and production activities to another country. However, the majority of its 100 or so employees do not want to change their place of work. Therefore, as well as setting up the new development and production organisation in the target country, the knowledge and skills from the original country must be transferred to the new team by a certain date and in as comprehensive a fashion as possible. This is the only way to ensure that production can continue in the target country without any disruption.

The company takes on an external partner for this change process who can provide extensive experience of knowledge management and transfer, as well as moderate the project as a neutral con-

The consultant obtains an initial overview of the situation in a preliminary meeting with the customer. The biggest challenge is to identify the huge amount of knowledge held by the employees and then transfer it smoothly. In order to visualise this knowledge, the service provider uses an extensive «toolbox» of methods.

The consultancy company develops a four-stage concept for the knowledge transfer, and primarily integrates visualising methods and tools such as knowledge maps. The first step involves familiarising the new employees with work processes at the original site, providing them with an initial impression of their area of responsibility. In the second step, the «knowledge owners» at the target site create a knowledge map of their specific area of knowledge and coordinate it with their colleagues' related areas of knowledge. Using workshops, the identified knowledge maps are coordinated with the «knowledge contributors» at the original site and any additions are
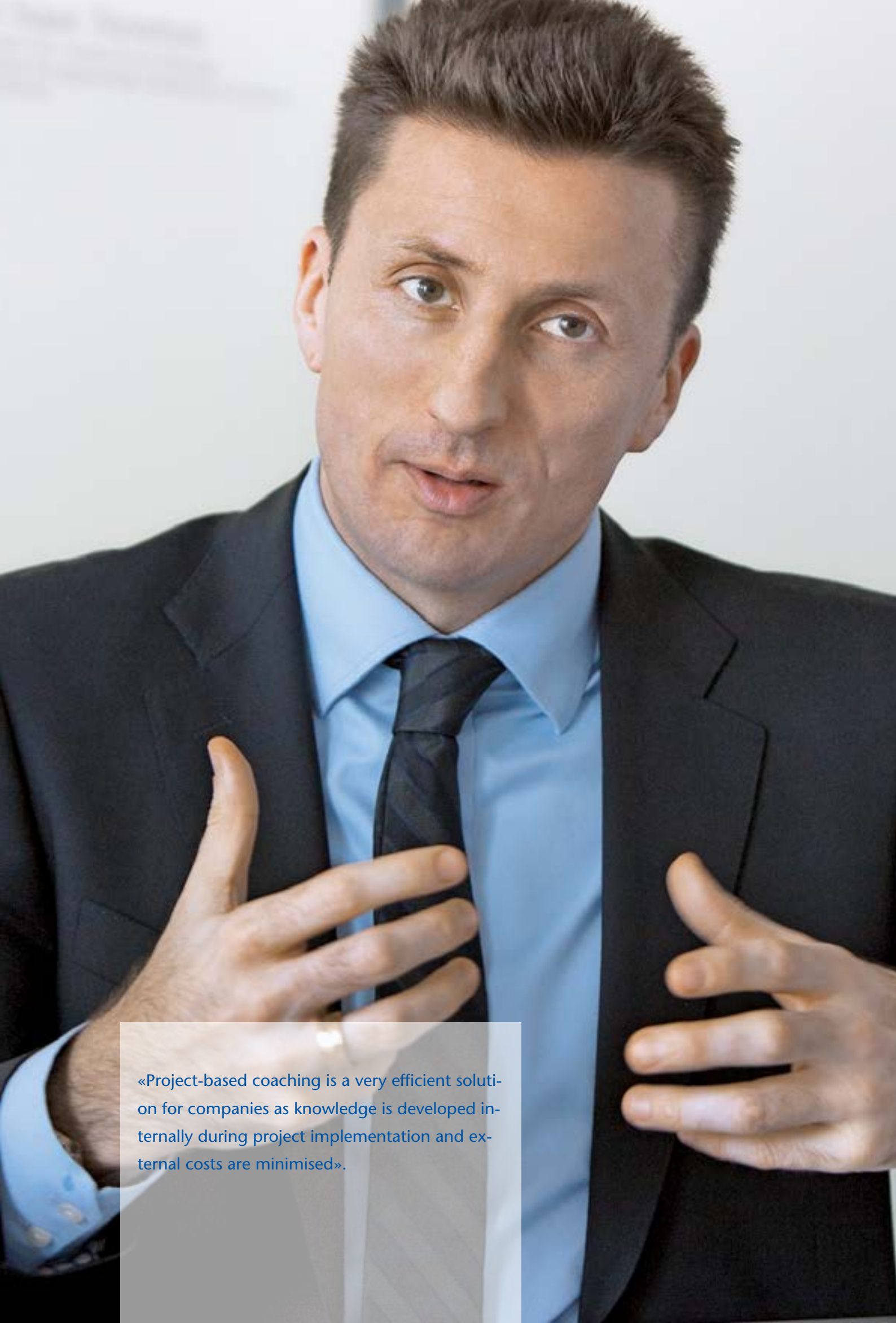
discussed. With the knowledge map as a «navigational aid», it is now possible to communicate and develop the missing areas of knowledge in a targeted way using suitable transfer methods. In this phase, the consultant provides support to the customer when choosing transfer methods and implementing transfer activities. The knowledge transfer concept is supplemented by efficient and on-going reporting on the acquired growth in knowledge.

The following elements are essential for the success of the project:

• Continuous presence of the responsible consultants and the new staff at the site.

• The use of visual facilitation techniques that reduce complexity and help to identify and structure the available knowledge.

• Professional change management throughout the entire transfer process .

Given that the development and production staff in the original country will leave the company at the end of the project, this presents a special challenge. In this case, the use of an external partner is particularly useful: Although the consultant is contracted by the company, it can still operate as a neutral party. This is because it did not make the decision to close the site, even if it is responsible for implementing it.

The consultants try to align all staff with the same aim, as well as supervise and coach those who will soon be leaving the company throughout the process. All of these efforts eventually lead to a seamless continuation of development and production activities in the target country.
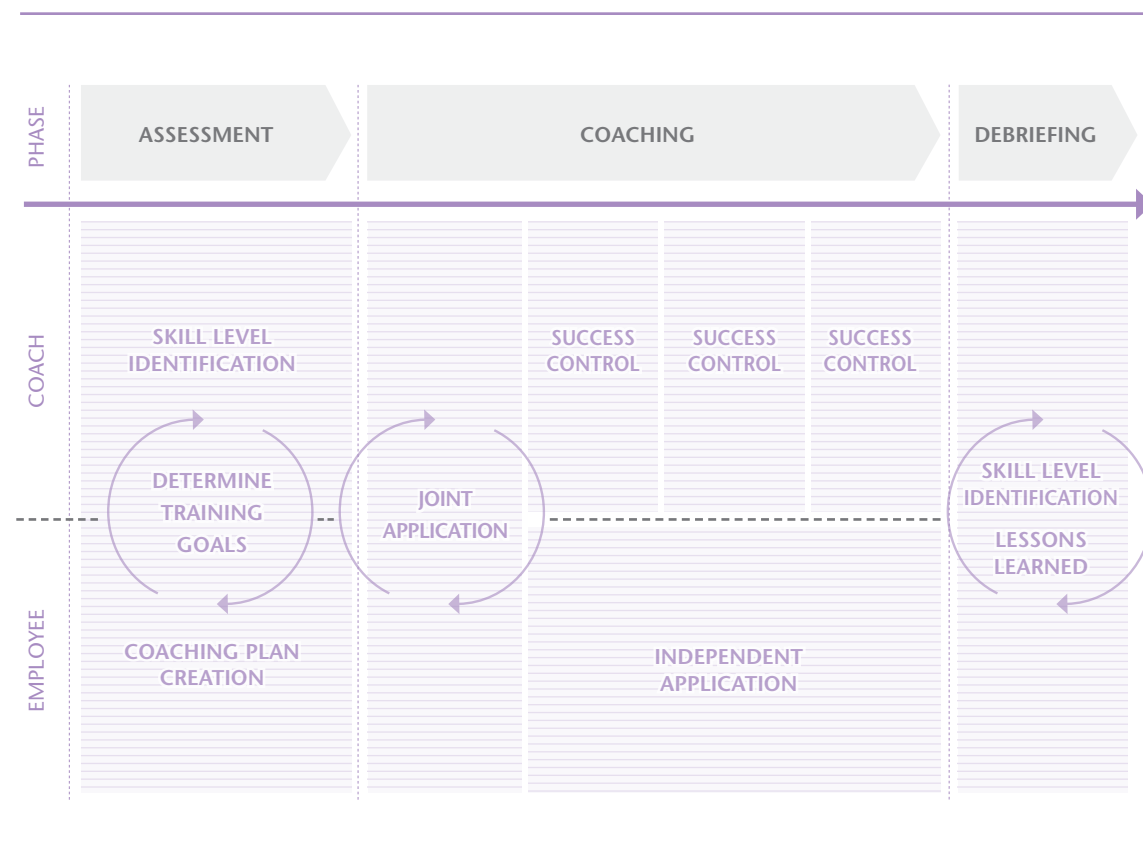
Example 2
**LONG-TERM KNOWLEDGE
DEVELOPMENT THROUGH
TARGETED COACHING**

An insurance company needs to introduce a new analytic Customer Relationship Management *(CRM)* system to a particular specialist area. However, the specialist department neither has the capacity to introduce this new system itself, nor does it posses the necessary project management or project leadership skills. This may jeopardise the success of the project.

The insurance provider wants to resolve this situation as quickly and efficiently as possible. It is therefore looking for a consultant who will successfully introduce CRM within a matter of months, and who will also expand the project leadership skills within the organisation through targeted coaching of a member of staff. The aim is for this person – and therefore the organisation – to be able to complete similar projects in a professional manner in future, without the need for external support.

The most efficient option is to develop the individual coaching plan for the member of staff in parallel with the project plan, or to derive the coaching plan from it. This requires the coach to have good conceptual abilities, and provide both the coaching skills and the necessary expertise for the content of the project. In this case, this is project management expertise.

«Project-based coaching is a very efficient solution for companies as knowledge is developed internally during project implementation and external costs are minimised».

FIG. 6: COACHING ROADMAP

The most efficient option is to develop the individual coaching plan for the member of staff in parallel with the project plan, or to derive the coaching plan from it. This requires the coach to have good conceptual abilities, and provide both the coaching skills and the necessary expertise for the content of the project.

Before the project and coaching process begins, an analysis must be completed *(Phase assesment at Fig. 6)* with the coachee: What is the level of this individual's skills and abilities? What learning goals are relevant to and realistic for the coached employee, and for the organisation, within the specified time frame for the project? In what areas and in what way can the coach best support his mentee and ensure the overall success of the project?

As a first step, all of these points are discussed between the external coach, the relevant supervisor and the customer. This is also the stage at which an individual or individuals are identified as candidates for coaching with regard to their further development. After all, it should be worthwhile for the coaching to enable the employee to take on new responsibilities. The second step involves a personal meeting between the coach and coachee. At this point, a good coach will ask «Am I the right person for this task and for the person being coached?» That's because the right «chemistry» and a bond of mutual trust are crucial to successful coaching, as there may be stressful situations along the way, be it because the coachee has reached his limits or because the project is coming under pressure.

As well as developing expert skills, coaching frequently also focuses on developing social and leadership skills — as in this example. The central issues during the CRM introduction relate to, for example, how the project manager handles employees who are demotivated or not performing to standard. In these instances, the advantage an external coach brings is a view from outside the company and a level of neutrality when examining it:

The external coach has no previous history with the company and so has no connections within it. He does not operate within its structures and therefore views all critical situations and individuals without any bias. What's more, he provides extensive experience and examples of other successful projects from which the coachee can benefit.

The objective of the coaching process is for the coachee to become more and more independent and self-reliant over the course of the project. The coach becomes more of a «sparring partner», with final decisions always remaining with the coachee. In this case, the approach was a success: The insurance provider successfully implemented CRM in just under six months, with the project managed by its own employee, and expanded the organisation's project management skills. And this was all achieved at a reasonable cost that would have been greater if an external project manager had been brought on board.

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