ERNI Experience reports on management, processes and technology

Experience

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PARTNERSHIPS
The right model for cooperation

COLLABORATION ACROSS LANGUAGE BOUNDARIES
Ensuring multilingual comprehension

TRANSFERRING RESPONSIBILITY IN TESTING
Using qualitative cooperation for testing

RAISING THE LEVEL OF MATURITY THROUGH A PROFICIENT PARTNER
Raising the customer's level of maturity

DUTY AND CHOICE IN COOPERATION

ERNI
enables & delivers

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This issue of EXPERIENCE looks at how customers can transfer greater responsibility to their suppliers and the benefits this may bring. If a company brings in external support, it has to decide how much responsibility and risk it is willing to assume in terms of the cost and quality of the services being purchased. If a supplier provides only human resources, it is the customer's responsibility to decide how they are used and the level of scaling flexibility is extremely restricted. Consequently, the thought of being dependent on external resources makes many customers uneasy. We use specific examples to show the expertise a partner should have at its disposal and the procedures it should have mastered to ensure it can assume more responsibility in a project while generating added value for its customers.

The first article therefore focuses on selecting the right model of cooperation from the extensive range of cooperation variants. We outline why you should place your trust in a partner that can tailor its model of cooperation to your particular situation.

The second article discusses the way in which projects can be successfully implemented despite language barriers. Read about tried and tested methodologies and tools that your partner can use in a responsible manner to overcome communication barriers in shared projects and ensure problem-free communication.

In the third article we use test situations to illustrate how and why responsibility can and should be transferred to ensure the quality of processes when interacting on software development and testing.

Greater involvement in a project enables a partner to achieve a more sustainable effect above and beyond the expected result. The final article examines to what extent an organisation can raise its level of maturity if the partner embraces its role in the collaboration in a responsible manner.

We hope you enjoy reading this issue!

Best wishes,
Oliver Blindenbacher

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THE RIGHT MODEL FOR COOPERATION

All models of cooperation require a customer to trust its partner to tailor the nature of the collaboration to the situation

A customer wishing to entrust responsibility for software development or maintenance to an external service provider does not need merely an «extended workbench», but rather a consultant who can organise the cooperation logically to provide a perfect balance of control and autonomy within the particular project.

BY RETO ZUMBÜHL, ADRIAN KÜNZLER AND MIROSLAV MAJSTRIK

If an external partner is to be appointed to fulfil specific tasks, considerable thought must go into selecting the best model for cooperation. A customer will soon recognise if it is on the right track when evaluating the suitability of service providers if, during the «sparring» phase, the service provider gives its active support with questions on how the collaboration will be set up *(see Fig. 1)*:

- Are the areas of expertise to be used or developed for the project strategically relevant to the core business?
- Are the necessary resources available, in terms of both skills and required capacities?
- How innovative is the project? Can a specification be generated so that the project is already suitable for outsourcing?
- Is the entire development project to be outsourced or only certain parts?
- And finally: How much trust has the partner already gained through its methodical approach for the customer to transfer responsibility to it? Conversely, which control mechanisms would be helpful in each process step and who manages these processes?

Numerous innovative variants are available, with the option of providing the customer with human resources for a specific project at one end of the scale, and the option of taking overall responsibility for turnkey solutions as a development partner at the other. It is impossible to state definitively that any given option is better or worse than the others, as every model for cooperation has its own advantages and limitations influencing the delicate balance between accountability and distribution of risk. It is therefore often worth involving a partner that has not stipulated a specific form of cooperation from the start, but is proficient across the entire spectrum and gears its methodology logically towards its customer's needs.

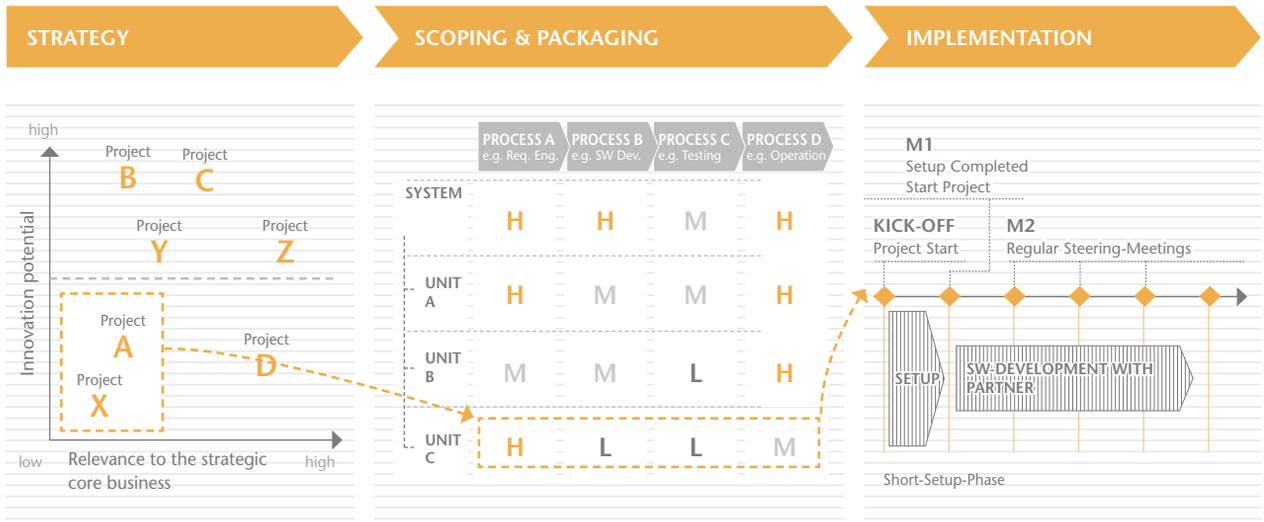
A paradigm shift has also taken place with regard to the cooperation between a customer and its partner: The customer no longer merely decides whether to «make» or «buy», but works with its partner to find the strategic cooperation model offering the best balance between responsibility, flexibility in adapting to specific requirements and distribution of risk for the objective in question. To achieve this balance, four factors can be defined for assessing the degree of responsibility that is held by the customer or partner:

1) Who controls the services provided?
2) Who is responsible for the continuous improvement process?
3) Who has bottom-line accountability?
4) How much flexibility is there in terms of scaling?

This means that if, for example, a project requires strategic relevance and a high level of innovation, the partner will ensure that it maintains as close and intensive an interaction with the customer as possible. The conventional and simplest way of achieving this is by the consultant operating on site at the customer's location. When this method is employed, the customer determines *(see Fig. 2, Model A)* the volume of work and in turn the capacity

«Our experience shows that there is a wide range of individual models for cooperation offering a specific balance of responsibility, flexibility in adapting to customer requirements and distribution of risk for a particular project.»

FIG. 1: PHASES IN STRATEGIC PARTNERSHIPS



LEGEND: H HIGH M MEDIUM L LOW SCOPE

A paradigm shift has also taken place with regard to the cooperation between a customer and its partner: The customer no longer merely decides whether to «make» or «buy», but works with its partner to find the strategic cooperation model offering the best balance between responsibility, flexibility in adapting to specific requirements and distribution of risk for the objective in question.

and skills required, on the basis of which the partner selects personnel. The customer is also largely responsible for providing the consultants with the appropriate working materials, as well as training them and increasing or reducing the size of the teams according to the amount of work to be completed. Ultimately the customer also takes responsibility for whether the project has been successfully implemented, and when. However, this does not mean the partner is freed from all obligation, as it can and must compile an appropriately organised on-site team and a methodologically sound setup that will provide the customer with the expertise it needs to achieve the required innovation.

The solution model *(see Fig. 2, Model C)* whereby the customer outsources the entire development project to a partner is quite different. In this scenario, the partner assumes full responsibility for delivering a turnkey solution by a fixed deadline, based on the documented requirements. A customer opting for this model should already have built up trust in a reliable partner, as the partner is largely given control of all four aspects. This means the customer is not required to recruit qualified personnel or provide the necessary infrastructure for development of the required solution. Nevertheless, an experienced consultancy company will involve the customer in these processes as much as possible. It will work proactively to devise a structured requirements management plan so that any changes made to the specifications by the customer can be gathered, incorporated and implemented methodically.

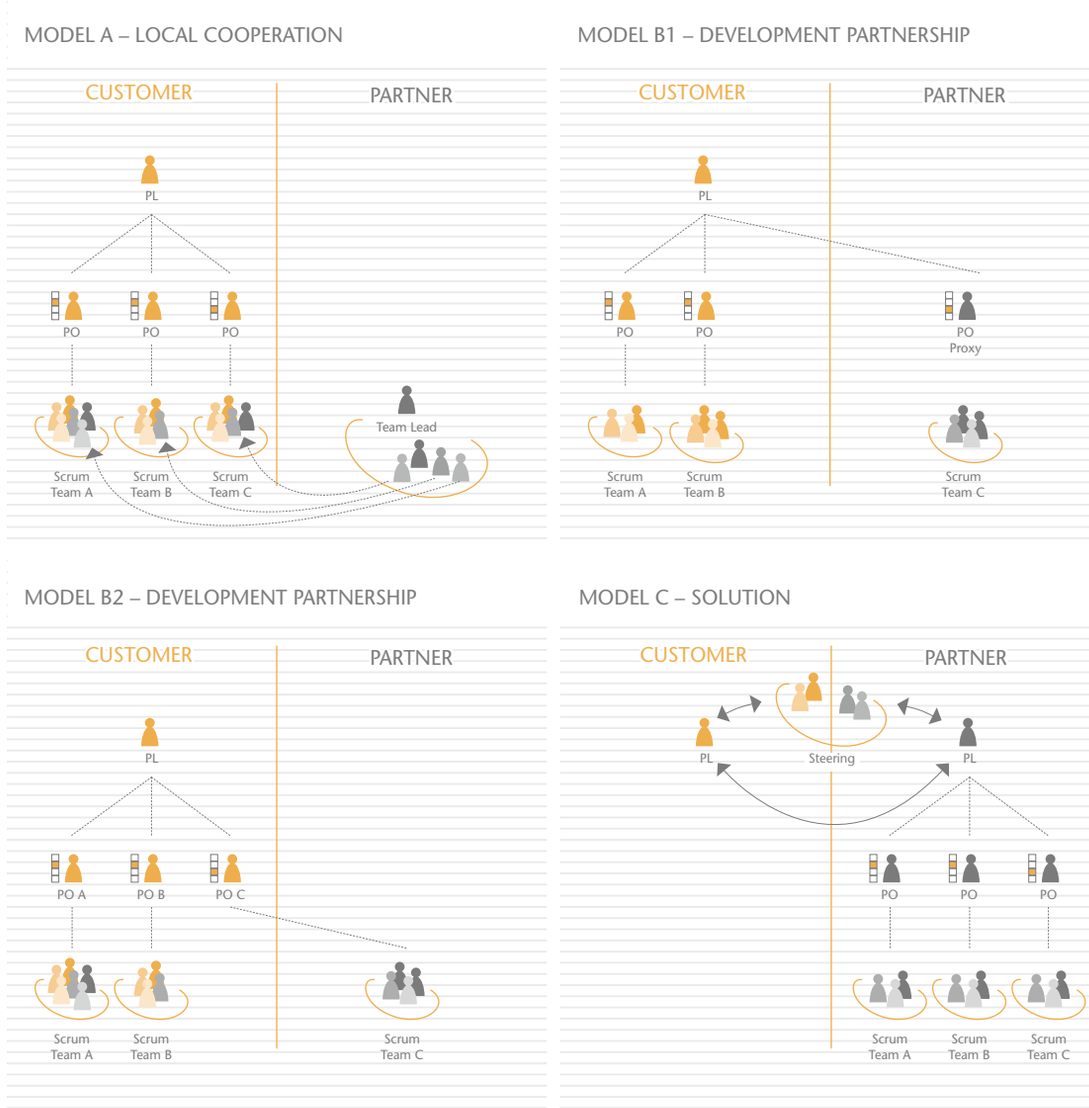
There are many possible variations and combinations whereby greater or lesser amounts of responsibility are transferred between the two extremes of consultants working on-site at the customer's premises and the «turnkey solution». Partial outsourcing tailored to the particular circumstances of a project is conceivable, such as the development of definable subsystems, where the partner assumes joint responsibility for these components. The range of options generally consists of development partnerships that are predominantly managed either by the customer or by the partner *(see Fig. 2, Model B2)*. In a development project, it may depend on where the person assigned the role of product owner in a Scrum-based setup, or the role of project/sub-project manager in a conventional setup, is located. By assuming this responsibility, the customer sets the priorities, defines the extent of the work and manages the teams accordingly. A good partner can nevertheless take responsibility for technical aspects by identifying potential for improvement. If the partner appoints the product owner, it must ensure that the product owner possesses sufficient domain expertise to manage the development project successfully and is capable of completing the product backlog promptly and correctly, and supplying the user stories. This provides the partner with more leeway regarding the range of services and quality assurance. One way of gauging a partner's level of innovation in the wide and complex range of cooperation models is by whether it can successfully guide a customer from one model to another where necessary, and the method it employs to do this.

Example 1

AS TRUST INCREASES, SO DOES RESPONSIBILITY

An industrial company developing administration software for its security sys-

FIG. 2: MODELS FOR DEVELOPMENT COOPERATION



LEGEND: **PO** – PRODUCT OWNER **PL** – PROJECT LEADER SCRUM BACKLOG

tems wants to retain control of its requirements management at the start of the project whilst fully outsourcing the software engineering. The first step is for the customer to analyse the requirements and user stories. While the customer appoints the product owner, the partner is aware of its own responsibility for providing the perfect combination of hardware and software. During the course of the cooperation, the partner submits regular suggestions for improvement, which are discussed with the customer and either approved or rejected for implementation by the steering committee on the basis of their strategic relevance and their impact on cost, quality and usability. This continuous input of ideas for additional innovative functions increases the customer's trust in its partner: The customer is aware that it can still influence the services even though it is only providing the specification. The development partner now generates the user stories based on this checklist of required features. In addition, the partner's project manager has developed such a high level of domain expertise that the customer assigns the role of product owner to the development partner. The technology consultancy company now has considerable responsibility; it has a say in how many employees, and which ones, it should use to implement the required functionality, and calls on such personnel as its development team at its European service centre. The customer receives regular insights into how work is progressing, and can be sure it will receive clearly defined, manageable costs for every function.

Example 2

LONG-STANDING PARTNERSHIP CREATES SCOPE FOR TRANSFER OF RESPONSIBILITY

A medical technology company requires data management and data analysis software for its devices, and

«If the partner steers the development partnership, the customer benefits from clear and predictable fixed costs. The customer can take it for granted that the partner will automatically allocate its resources to create added value within the project as efficiently as possible.»

has a long-standing partnership with an engineering and consultancy company. The customer therefore knows that its partner's development team shares the same set of values and is proficient in using the same methods. The customer therefore appoints a Scrum master and product owner, preferring to work with the partner's team directly using this arrangement in order to achieve greater speed and efficiency. The partner's developers spend four months working at the customer's site to ensure maximum involvement in the project setup. Once this phase is complete, virtual handover and planning meetings are held at regular intervals to notify the engineers systematically of the requirements of both the R&D team and the specialist department. This also allows them to acquire the necessary knowledge to make a proposal to the customer regarding a fundamentally new architecture for the proposed software that would enable optimum usability. The resulting application, which has taken a year and a half to develop, is now fully operational and is being maintained by the partner's established team.

The customer's trust in «its» developers' efficiency and expertise was further strengthened during the development process, when a bottleneck occurred while the customer was programming the control software for the device in C++. The close cooperation between the customer's Scrum master and product owner and the partner's programmers meant that the partner was able to provide qualified personnel at short notice to make up time in the final push. This example shows how the partner in this type of setup can briefly take extra responsibility to provide the customer with flexible support.

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ENSURING MULTILINGUAL COMPREHENSION

Partners with experience of international cooperative ventures are proficient in the methods that help make a multilingual project a success

International cooperation sometimes involves teams from different linguistic regions. Customers should therefore put their trust in a consulting partner with experience of cooperation across national boundaries and the ability to select the best procedure to aid communication.

BY PETER ZUBER AND CHRISTOPH ZÜRCHER

Europe's multilingualism is not without its charms — in many multinational companies, it is now common practice to talk in different languages, resorting to English if necessary. But when precision and comprehension are key and it is essential that nothing is misinterpreted, such as in complex software development projects, a colloquial knowledge of a foreign language is not usually enough to guarantee mutual understanding. A methodologically adept consulting partner understands the challenges that linguistic problems pose and has an array of tools at its disposal to configure a project across all languages so that the customer experiences seamless communication. A German-speaking customer should ideally have a German-speaking contact at the partner's company. It is also advantageous if the partner in an international model for cooperation is supported by its own German-speaking experts. These experts should form a well-established team that is familiar with the methodology and shares the same values so that they are in an ideal position to mediate between the customer and their own colleagues. Taking this approach will prevent potential language barriers from ever becoming a problem.

Nevertheless, when a particular concept is under discussion, an experienced project partner knows only too well how important it is for everyone to be on the same page when they are all speaking their mother tongue, let alone across language barriers. When setting up a project, the project partner therefore firstly ensures that the customer and the development partner coordinate their basic level of maturity and attain a common understanding of the project's objectives and requirements. This fundamental mutual understanding must also encompass the terminology to be used for communicating within the project. One option that has proven to be effective is a glossary in which all the relevant concepts, technical terms, functions and roles are clearly defined and their usage is organised systematically. If translations are required, terms are clearly assigned to the source and target language. The customer must be confident that the partner has experience of correctly briefing its employees. This can be achieved using walkthroughs in which the requirements and specifications are dissected step by step and pertinent questions are posed to ascertain whether the other party has interpreted everything correctly. It is then irrelevant to the customer where its partner obtains its resources if the partner's methodology is identical in all locations and fulfils its responsibility for problem-free communication.

It is important to remember that glossaries and walkthroughs are tried and tested tools that will have a decisive effect on the success of any project, not only those in which language barriers

«In different linguistic environments, it is important for a common understanding to be achieved and verified.»

have to be overcome. The same applies to the approach of «giving meaning» to the project. A development partner aiming not only to complete the project «as instructed» but actually to be a driver for its customer will also familiarise itself with the context of the project. By using the right methodology, it can advance to a meta-level in the project: «What purpose will the developed solution actually serve?». An understanding of the specialists' and developers' different *(linguistic)* environments plays a significant role in this regard, in addition to domain expertise. If the developers understand the overall context so that they can visualise and identify with the project, they are in a much better position to make constructive contributions, ask the right questions and think outside the box. In this respect, genuine comprehension means more than merely the language used for communication.

Example 1

USING A WALKTHROUGH TO ENSURE COMPREHENSION

A public sector company is working with a technology consultancy company to implement an IT project designed to simplify dialogue with the public. The consultants at the partner's company come up with the idea of adding a mobile app to the platform to enable the customer to provide the public with an extra service. The basic business logic for this is already available on the IT platform so the mobile app is merely an extension to this, with a manageable level of complexity that makes a specification easy to generate. Since a high level of common understanding of the project has already been achieved, the customer is able to translate its requirements for itself. The customer then transfers all responsibility to its partner, which works through the specifications with its em-

ployees in its service centre who are already familiar with the project. The programmers describe how they understand this additional task based on their knowledge of the existing context. Questions and answers are used to check and double-check that all parties share the same understanding of the concept and the product to be developed. After a process lasting just a few months, the customer's application is ready to use.

Example 2

GIVING A PROJECT MEANING FOR ADDED ACCESSIBILITY

A leading company in the security sector requires a software package for its hardware components. To develop the software, the company engages a local partner that operates development sites in Europe and the Far East. A product owner assigned by the partner acts as an intermediary, communicating with the customer in German and with its development team in English. In this case, however, it is not the foreign words that create the language barrier but the technical jargon: The customer is used to «hardware language» and hardware development using the waterfall model. Furthermore, the security sector uses highly specific vocabulary with a lot of technical terms.

The product owner has extensive experience of gathering comprehensive, structured requirements and offers both domain expertise and methodological expertise.

The product owner's role as a mediator «between two worlds» means ensuring that a complete product comprising both hardware and software is produced with no misunderstandings or misinterpretations.

First of all, the partner creates a glossary containing all the technical terms together with their definitions and consistent translations. In sectors as specific as this, it is particularly important that the people involved have the same understanding of the technical vocabulary, as technical terms can be ambiguous even in German so that they have to be understood or interpreted intuitively. The customer now benefits from having its own «encyclopaedia» for future projects, containing an accurate breakdown of all its terminology.

But not all problems can be solved with a glossary; the main issue is translating the customer's concept from industry-specific terminology into IT terminology. The product owner has an IT background and is therefore able to rewrite the requirements for the developers in their own «language».

He believes an additional factor for the project's success would be to bring the team on board mentally to enable them to make a valid contribution. Consequently, he uses walkthroughs to familiarise the team with the context of the project so that they can then ask the right questions. In addition, the development team is shown a film about the product, its applications and its features. Gaining an insight into the product's intended use gives the developers a better understanding of the requirements and specifications. Even if the product information does not have a substantial effect on the requirements, it gives the project meaning and turns mere work

«If a project's meaning and purpose are comprehensible and the partner is also aware of the overall context, the partner will not merely write program code but will develop a concept to provide the customer with added value.»

«International models for cooperation can deliver their full potential if the partner sets up the services to ensure that they use the same methodology in the areas where they create the most added value.»

into active involvement. The project is expected to take a year and a half to complete and is running on schedule.

Example 3

VERIFYING INFORMATION AND ACKNOWLEDGING COMPREHENSION

A Swiss insurance company's technology consultant sees potential for its customer to save costs by outsourcing some of its IT operations, in particular the on-call support service, so that the in-house IT department can be used for more complex tasks. The partner takes over the operation and development of applications in its service centre. Since most of the applications were developed in-house, no product documentation is available. An agreement is reached for the partner's team to work with the customer to compile the documentation. The working groups are of different nationalities, but the documentation is drawn up in the service centre team's language. A glossary is added to the resulting information, followed by a walk-through in which the team outlines what it has understood. This ensures that the documentation is of a high quality, and the face-to-face cooperation on site is good for team building and promotes identification with the project. After all, it is often the case that a mere translation is not enough; every translation is one person's interpretation in which information can sometimes be lost, so giving meaning and context to a project can play a key role in preventing potential misinterpretations. It is very important to ensure that the information that has been conveyed is verified on a continuous basis, as well as to encourage the team to acknowledge their level of comprehension and to invite questions; the quality of the questions that are asked can reveal the extent to which the developers have understood the requirements.

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USING QUALITATIVE COOPERATION FOR TESTING

Testers taking responsibility for the quality of the end product thanks to methodical and structured procedures

At first glance, testing appears to be a purely routine task. However the tester has a lot of responsibility – the expected quality of a service or product is only confirmed by testing. An experienced and methodical partner can help to keep time and costs under control and in keeping with the desired level of quality.

BY STEFAN WEBER, ANDRÉ HORISBERGER AND PHILIPP REY

The complexity of a software project is often underestimated, which frequently results in project delays: The development process takes longer and at the end it is a relief that the software works at all. The project team may be tempted to use the test stage to save time that they have lost. In a scenario such as this, three temptations are particularly hard to resist; the first is to only test the things that are absolutely necessary, at the expense of test coverage. The second is to keep putting off the testing process until the eleventh hour, only to find there are no qualified testers available on site. In this case, the third temptation is to leave the testing to the software developers themselves.

However one of the most important principles of testing is «separation of powers». The first part of complying with the principle of dual control in quality assurance is that developers do not test their own software. A separation of powers also means that the budget for testing or for the appointed team is used only to perform the specified services and attain the required quality level.

In the ideal scenario, an experienced partner has expertise in the complete software development process, right up to the testing stage. In a well-established cooperation, the partner can guarantee the desired quality thanks to its process maturity, even in a complex situation and under extreme pressure. Calling in a partner also ensures that the testing process is well structured and that the test team is available to work on the project at the required time. The consistent methodological organisation of test processes results in well-ordered communication channels and easily planned work steps with clear deadlines, creating added value for the customer and thereby enabling the company to raise its level of maturity as a «by-product».

The testing process is particularly suitable for outsourcing because it is advisable for an impartial party to immerse itself in the software requirements and architecture, as well as design the test cases professionally and implement them without bias. With this in mind, it is easy to succumb to the temptation to take advantage of the «bargain» test resources available around the globe, but beware!

Goal-oriented, methodical software testing means all requirements are re-inspected and verified with the customer if necessary. This calls for testers who can take an overview of the entire process and who are well versed in the fields of software engineering and requirements engineering. They should also have experience of requirements management.

«The most important concept in the field of testing is «separation of powers»: The principle of dual control is the only way to evaluate software quality objectively.»

In the ideal scenario, an experienced partner has expertise in the complete software development process, right up to the testing stage. In a well-established cooperation, the partner can guarantee the desired quality thanks to its process maturity, even in a complex situation and under extreme pressure.

The consistent methodological organisation of test processes results in well-ordered communication channels and easily planned work steps with clear deadlines, creating added value for the customer and thereby enabling the company to raise its level of maturity as a «by-product».

A key factor for success for both the customer and the testing partner is effective communication with the customer's software developers. Ideally, this bridging function should be performed by the test manager who is already on site at the customer's premises, as he is responsible for the test setup and the test planning process, and coordinates the test team and records the test results. If the test manager can count on the well-established, structured processes that allow for efficient cooperation with his test team, the team's geographic location is irrelevant. The outsourcing option therefore offers great potential for test activities, as it combines cost-effectiveness with flexibility and responsibility for maximum quality.

Example 1

CREATING ADDED VALUE THROUGH RESPONSIBILITY

A government institution is developing a new software package to simplify the approval process and enable applications to be registered online. The customer is hiring a third-party provider for the technical implementation of its requirements and an on-site partner is providing support with the testing process. The project is being implemented using the waterfall model, and the partner notices during the first test iteration that some of the requirements have changed considerably compared to the existing test cases. New services for interfaces to essential peripheral systems also have to be connected. The partner looks for solutions to adapt the test cases to the new requirements economically and with as little delay as possible. Because all the documentation is in German, which is also the project language, the proposed test team should also speak German. The partner achieves this by assembling a team of German-speaking employees at its service centre, which redesigns the test cases and conducts the tests in parallel for the same test iteration, at a lower cost but with the same quality standards. The customer benefits from its partner's assumption of responsibility for the high-quality and punctual provision of the service, partly due to the fact that the responsible test manager is a member of the core project team. The test manager takes care of all the necessary coordination so that the customer has no additional expenditure and does not have to evaluate, reserve and train individual test resources.

Example 2

RESPONSIBILITY FOR AGREED TEST COVERAGE

As part of a development project for a new product that is already at an advanced stage, an industrial company wants to examine ways of reducing costs, particularly during the software component test phase. The project is an extremely complex one, however: Extensive test coverage is required for regulatory reasons and the stipulated automated test case implementation must be conducted by testers experienced in software engineering. The selected external technology consultancy is able to provide these experts and also has a suitable service location. The partner knows from its consulting experience and previous cases which projects are suitable for outsourcing. The


«The importance of testing should not be underestimated, as reliable quality control is essential and ultimately determines the degree of customer satisfaction.»

«Responsibility is also scalable in the testing process, provided the partner is able to achieve the optimum balance of cost-effectiveness and quality.»

case in question is an easily isolated software component that can be tested using a software test framework in a virtual test environment, without the need for additional hardware. The partner therefore provides the customer with support in the form of an appropriate model for cooperation involving local contacts and a qualified, dedicated test team. All the customer has to do now is train the test manager in the domain expertise at its premises; the test manager then holds regular training sessions at the partner's service location to pass on the knowledge he has acquired. The customer benefits from a methodologically sound team that has a skill level precisely tailored to the required test coverage and that can fulfil its requirements cost-effectively.

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RAISING THE CUSTOMER'S LEVEL OF MATURITY

The higher the level of expertise shown by the consulting partner at the customer's site and the more responsibility it takes, the higher the level of maturity of the customer's organisation

Potential for improvement can be identified and realised at many different levels: through technology or processes, by increasing employees' expertise or by raising the organisation's level of maturity. The best way to achieve this is by selecting a consulting company with engineering expertise as a partner.

BY OLIVER BLINDENBACHER, JEAN-CHRISTOPHE DUMÉRIL AND CHRISTIAN EICHENBERGER

A good engineer with consulting expertise is not content merely to accomplish the task he has been assigned. His rule of thumb is to ensure that, on completion of the project, the customer is satisfied when it reflects on the cooperation with the external partner and has developed itself as an organisation too. These benefits often cannot be precisely quantified, but instead become discernible gradually as the organisation's level of maturity increases.

The best way to evaluate an organisation's level of maturity is generally by the quality of its interfaces. Requirements management is a prime example. If software is developed in-house, an informal requirements elicitation meeting is often considered sufficient for clarifying ambiguities or closing loopholes. The situation is quite different when a partner is involved in the software development process, as this creates an interface between the requirements elicitation and programming teams, so the requirements must be more quantifiable and presented effectively. The partner must resolve any interface issues and empower the customer with the necessary expertise to adequately analyse the requirements.

Processes involved in the transfer of responsibility for specified work steps and sub-operations must also be structured systematically and followed. It is also possible to judge the partner's quality and expertise here. Does the partner use a well-structured methodology and at the same time, is the partner capable of finding individual solutions for the specific project that accurately reflect the customer's perspective?

Such a partner considers raising its customer's level of maturity «on the job» to be part of a consultant's remit as a «by-product» of its work to provide quality assurance at the interfaces. The customer can also benefit «in passing» from its partner's substantial experience in best practices throughout the partnership. When working in a partnership, a good consultant not only adapts to its customer but also develops clear structures, works methodically and creates new processes where none are available. The organisation's level of maturity increases automatically as a result, even if this is not one of the project's specified objectives. Of course, besides contributing structured methodology, the partner must also be committed to questioning customary thought patterns from its neutral position and acting strictly in the customer's interests.

Example 1
HELPING THE CUSTOMER TO ACHIEVE MATURITY

An industrial company is dissatisfied with the quality of its requirements for a

«A conscientious partner identifies potential for improvement based on past experience and focuses on the areas where change is actually possible.»

FIG. 3: FROM THE ORIGINAL CONTRACT TO THE GENERAL LEVEL OF MATURITY IMPROVEMENT

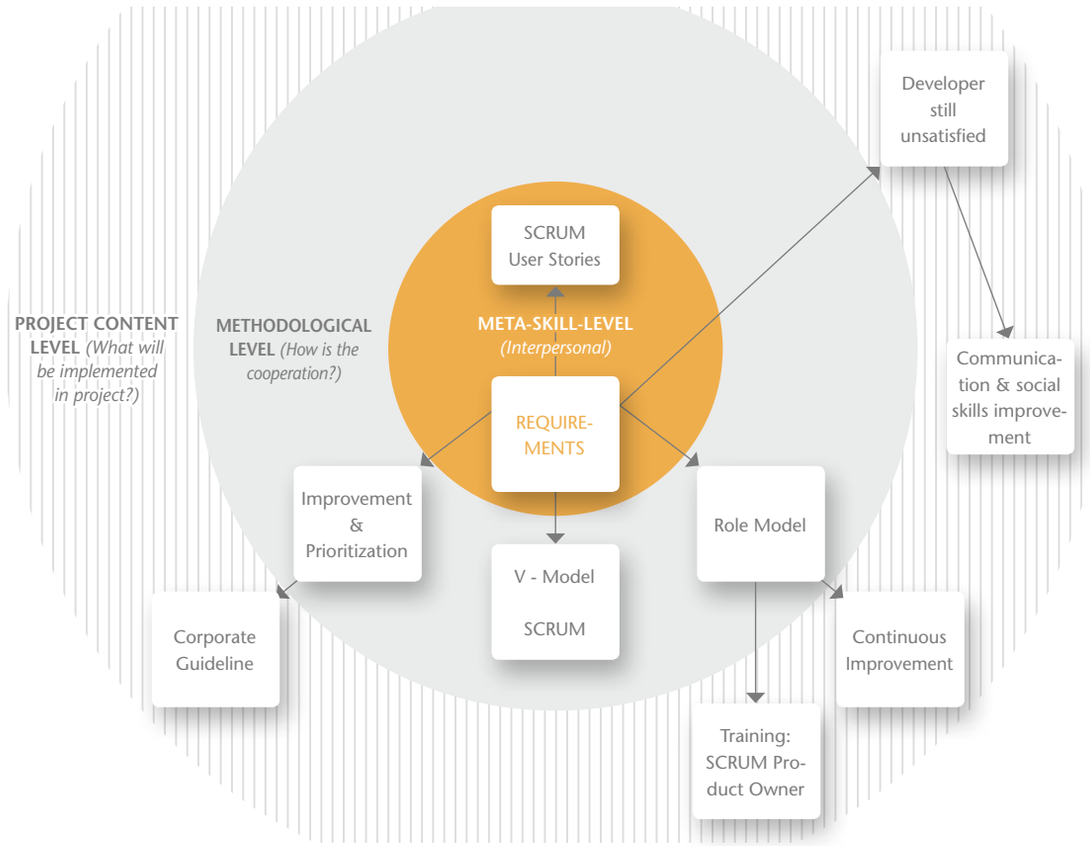
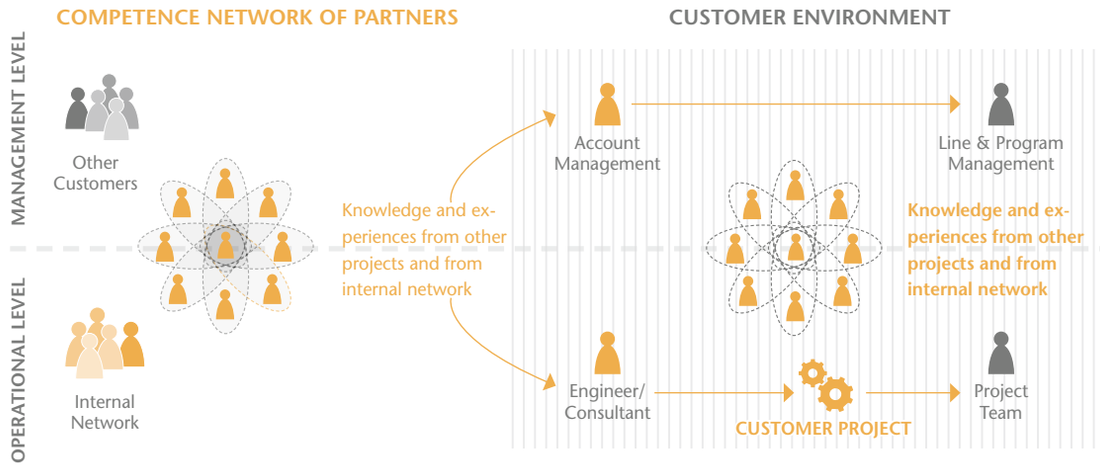


FIG. 4: KNOW-HOW IS MEDIATED AT THE OPERATIONAL AND MANAGEMENT LEVEL



The best way to evaluate an organisation's level of maturity is generally by the quality of its interfaces. Requirements management is a prime example.

device comprising both hardware and software. It commissions a partner, providing a requirements engineering mandate. The consultant's task is to improve the requirements. The dedicated requirements engineer completes this task, but his neutral position allows him to see that it is not only the requirement quality causing problems for the software developers. It emerges that the lines between software development processes using the waterfall model and those using the Scrum approach have not been drawn clearly enough in the customer's company. There are also misunderstandings concerning priorities and interfaces within the Scrum teams themselves. The partner offers to go beyond its requirements engineering activities by helping the customer to compare the software development team's expectations with those of the product owner, assisting with the generation of user stories and assuming the role of moderator to enable everyone involved to achieve better coordination and communication. In particular, workshops are held to define the range of functions from project manager to software architect, and to make clear distinctions between their respective responsibilities.

Following its identification of a symptom, the consultant responds proactively by proposing a recommended course of action and taking highly specific measures. In the subsequent phase, these measures affect the customer's entire organisation *(see Fig. 3)*: Management approves a company-wide extension of the role definitions and modification of the corporate guidelines to enable the new roles to be integrated into the company as a whole. The employees are provided with training at the management's request so that they are able to put their theoretical understanding of the roles into practice. The consulting partner also prompts the introduction of a regular review system to check that the roles are being implemented and to indicate any areas in which they may need to be further improved. Consequently, the entire company's learning curve has improved as a result of a single project. The advantage of this success lies in the fact that the external consultant is acting constructively and without bias, based on previous experience, and can translate its methodology into tangible recommendations for action. Unlike increases in the level of maturity that have been «prescribed from above», this approach has proven to be highly efficient if it is applied directly where a specific need for action is identified. Once the introduced improvements are seen to be worthwhile, they will be deployed across the whole organisation, thereby gaining greater acceptance.

Example 2

ACCELERATING THE CUSTOMER'S LEARNING CURVE

A large company in the public sector entrusts its software development to an external consultant. The customer is actu-

«A consultant's network is his key asset; the collective experiences of his many contacts give rise to new knowledge and, as a result, innovation.»

ally planning to elicit the requirements itself but asks the development partner to appoint a methodically experienced requirements engineer to generate and formulate the requirements correctly. The requirements elicitation can then be effectively completed using well-structured templates and processes. Over the course of the partnership, the experts also learn to understand the criteria to be followed and eventually become capable of generating acceptable requirements themselves. The methodical external support has prevented errors, avoided unnecessary loops in the process and ensured the quality of the software. At the same time, the organisation has gained in-house expertise without the need to invest in separate education and further training.

The partner's account management team supports the customer and highlights any potential for improvement wherever it identifies risks that could impair the teams' efficiency. For example, the customer is advised that a new role could be the best way to coordinate all the requirements of the different development teams working in cooperation. The customer gains clear advantages from its partner's consulting expertise, even though this service is not an actual part of the project, and derives tangible benefits from the fact that the partner feels responsible for strengthening its customer's long-term position *(see Fig. 4)*.

Elsewhere, technological decisions have to be made for which the company feels it still lacks sufficient maturity. The partner contacts one of its customers that has already implemented a similar solution. A workshop organised by the partner proves to be a valuable exchange platform for everyone involved, allowing the company's management to reach decisions more quickly and from a more informed basis. The project itself is set up and implemented more efficiently, reducing the time to market and increasing the added value.

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