

ERNI Experience reports on management, processes and technology

# Experience



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LEAN SOFTWARE DEVELOPMENT

Free up resources instead of wasting them!

INDUSTRIALISATION

Creating space to innovate: division of labour, specialisation & economies of scale

COMMUNITIES

Innovation «from the bottom to the top»

TIME-TO-MARKET

Implementing innovations quickly

# BOOSTING INNOVATION

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«Faster, better, smarter» – Innovation management is just like high-performance sports. In the same way an Olympian gets fit for competition by avoiding setbacks and by being proactive, companies also need to be well-prepared for their next innovation. Also, just as an athlete must trust his/her trainer to guide them to their peak performance; companies can rely on partners to cover their backs. In this way they are free to concentrate on their core competencies and on strengthening their innovative power.

The first two articles in the current edition of EXPERIENCE are dedicated to the question of how companies can create space for the machinery of innovation to be set in motion. «Lean thinking», the subject of the first text, helps reduce frictional losses while improving the process flow necessary to leverage freed-up resources for the generation of added value.

High-quality creative work is too costly to be expended on routine tasks. Thus, the industrialisation of processes and their outsourcing to specialised service providers allows companies to focus on core competencies in their own business. The second article deals with how this works.

Innovation does not materialise of thin air. The ideas are there, in the minds of employees – they just need to be uncovered. The role communities play in the innovation process and how they can be used to the benefit of a company is the focus of the third article.

«Who's in first place?» Keeping with the sports metaphor; only success counts. Whoever brings the innovation to the market first, wins. Here the right partner can make the difference between victory and defeat. For more on this, please refer to the fourth article.

We hope you enjoy reading this issue.

Best wishes,  
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## LEAN SOFTWARE DEVELOPMENT

### FREE UP RESOURCES INSTEAD OF WASTING THEM!

Competitiveness can be increased by maximising the value of existing resources and avoiding waste.

BY ANGUS LONG AND HERVÉ MENAGE

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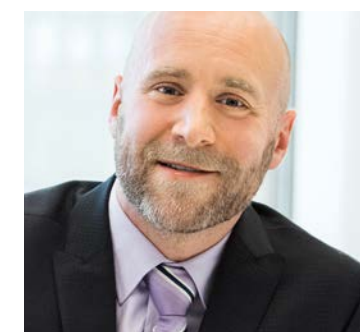
## INDUSTRIALISATION

### CREATING SPACE TO INNOVATE: DIVISION OF LABOUR, SPECIALISATION & ECONOMIES OF SCALE

Thanks to outsourcing industrialised processes, resources can be mobilised at the touch of a button – and the mind can be relieved of repetitive burden.

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### IMPLEMENTING INNOVATIONS QUICKLY

Rapid availability of scalable resources and focussing on the essential – so innovations reach the market quickly.

BY OLIVER BLINDENBACHER AND PHILIPP LEHMANN

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# FREE UP RESOURCES INSTEAD OF WASTING THEM!

Competitiveness can be increased by maximising the value of existing resources and avoiding waste.

Business principles that were once used in «lean manufacturing» can also be leveraged in software development to streamline processes, increase efficiency and free up resources for innovation. This requires the right methodology to ensure that the value-added process is properly filtered and that waste can be reduced or eliminated.

BY ANGUS LONG AND HERVÉ MENAGE

If a company wants to remain competitive on the market, it must use its resources as efficiently as possible to generate added value. In order for the creation of added value to also meet the needs of the customer, it is absolutely essential to first identify the value to be created: What is so unique about my company's offering that my customer is willing to invest his money in the output of my business activities? As a first step, those activities that increase this value need to be identified all along the value chain, as well as those that are wasteful and result in the full added value potential not being met.

This principle of consistent focus on adding value has its origin in lean manufacturing, but over time has also established itself in other domains in the form of «lean management» or «lean thinking». The guiding principle of «lean» is to eliminate everything that leads to the waste of resources. Logically, by using this principle, resources are freed up for value-adding activities – i.e. in innovations for the benefit of the customer. The principle is universal and thus it is not surprising that the streamlining of processes is also increasingly becoming a topic in the field of software development.

The same is true here as in any type of production: Resources are scarce and should be incorporated as fully as possible in innovations in order to stand out on the market. When products are increasingly being differentiated by how good their

software is, it becomes obvious that the focus should be on the development of that software. «Lean thinking» is already at the heart of agile software development methodologies: Prioritise, keep the process flowing and quickly achieve measurable success. But agile is not quite the same as lean – «lean», in terms of software development, goes beyond agile. It is interdisciplinary and includes upstream and downstream processes. Thus, it is worth enlisting a consultant who has experience in a variety of methods and tools as to how, from this point of view, value chains should be analysed and problem areas isolated – and how these should be remedied using the most appropriate measures.

A classic type of waste occurs in the «transport» from interface to interface – when information needs to be transmitted from person to person, business to IT, requirement to system specification or data from system to system. Essential groundwork can be done as early as the set-up stage of a development project (*during the search for the most suitable collaboration model or the team setup*) to ensure that both information and data flow optimally.

Other types of waste recognised in «lean manufacturing» can also be observed in software development: «Inventory» can build up, for example, as the user story backlog is filled, or when user stories are not systematically prioritised or certain features are not fully developed. Another type of waste, unnecessary «movement», stems from too many features being

«To tap into innovation potential, the required resources first need to be freed up.»



FIG. 1: HOW TO MAP A VALUE STREAM

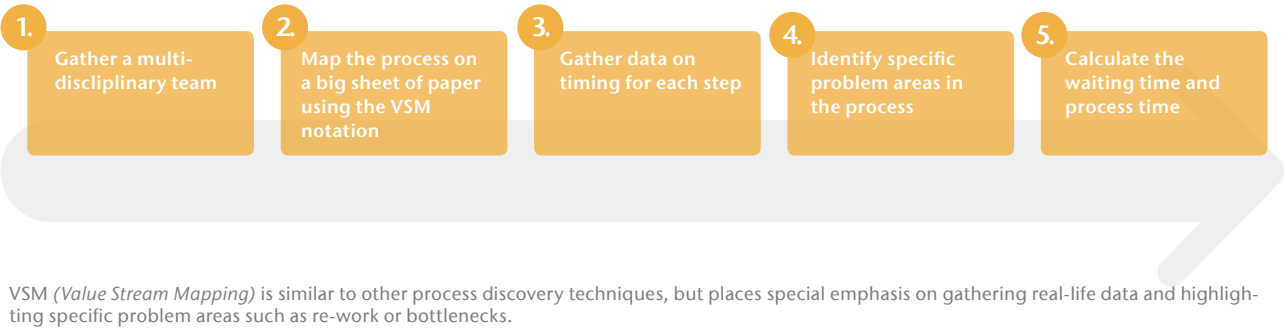
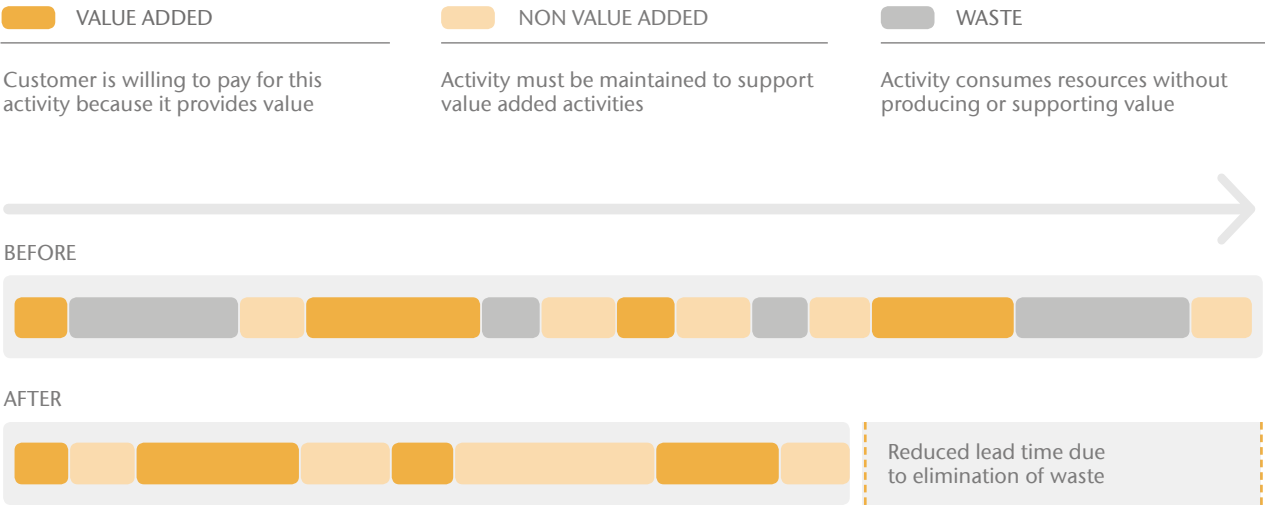


FIG. 2: VALUE AND WASTE



This figure illustrates the core concepts in Lean, value and waste, and why it is necessary to reduce waste to shorten process time.

worked on at the same time or from users constantly switching between different tasks. Additionally, «Over-production» and «over-processing» frequently occur when, for no real reason, features are added or «overly polished» which are either not necessary or could perform the same function with less work.

Consistently applying agile process models, e.g., Scrum with well-prepared sprint planning and frequent feedback cycles to make corrections, is a possible means of avoiding these pitfalls. Another approach is the «minimum viable product», where you limit yourself to just a minimum number of features in exchange for rapid time to market. Another particularly powerful tool for managing the workload and utilisation of development teams is «Kanban». By classifying features as «pending», «in process» or «completed», and by limiting the work in progress, a kind of traffic-light system is created, preventing bottlenecks. As one of the most important «lean» tools, Kanban not only proves useful in agile software development but also when it is applied to the classic «waterfall» model.

One of the largest wastes of resources is defined in lean thinking as «waiting», i.e., the time before the next process step can be performed. Although waiting times cannot be completely avoided, they can be reduced when release processes are streamlined, the workflow is well organised or feedback dates are simply known from the outset so that the team can plan accordingly.

Finally, «defects» also use up resources. They can result, for example, from incorrectly set up development or test environments or faulty test scenarios.

Well-configured tools, pair programming, test automation and test-driven development (*TDD*) are proven methods for either avoiding errors in the first place or for resolving them promptly.

In the case of almost all waste, organisational measures can help to use resources more efficiently. However, companies' development departments often lack time in day-to-day business to question existing processes and test routines. External consultants, however, have the ability to kick-start changes using their neutral perspective and wealth of experience. In the first instance, they can help by initially recognising and identifying waste. Value stream mapping, for example, can be used for this as it traces the company's value-added processes from beginning to end, and shows at which points typical bottlenecks are being formed in the process flow. The process improvement itself may be carried out based on methods of continuous improvement such as Kaizen. In addition, capability maturity models or other reference models, which can be used to define and measure actual and target situations, also help to assess effectiveness of the improvement process.

It is particularly important to stress at this point that it is not a question of a «one-size-fits-all» approach which solves all the problems in one fell swoop. A good consultant will guide his customers step by step throughout this change process and apply the method that best suits their situation and needs. This is especially important since the identification of waste and its elimination does not follow a single big-bang scenario, but must be embedded in an ongoing change management process.

FIG. 3: THE «SEVEN TYPES OF WASTE» WITH EXAMPLES FROM SOFTWARE DEVELOPMENT

 WASTE	 EXAMPLES FROM SOFTWARE DEVELOPMENT
1. TRANSPORT	<ul style="list-style-type: none"><li>✓ Handoffs from one developer to another</li><li>✓ Information loss in translating requirements into lower level requirements and via different representations</li><li>✓ Exchanging data between two systems</li></ul>
2. INVENTORY	<ul style="list-style-type: none"><li>✓ Requirements or user stories backlog</li><li>✓ «Technical debt»</li><li>✓ Non-deployed software / uncompleted features</li><li>✓ Code that should be refactored</li><li>✓ Too many features in progress at once (<i>also leading to task switching - see «Motion»</i>)</li><li>✓ Know-how that is not documented or transferred between the team members</li></ul>
3. MOTION	<ul style="list-style-type: none"><li>✓ Task switching</li><li>✓ Working on too many features at the same time</li><li>✓ Having to search through multiple reference sources</li></ul>
4. WAITING	<ul style="list-style-type: none"><li>✓ Requirements changes awaiting change control board approval;</li><li>✓ Waiting for clarifications on requirements</li><li>✓ Waiting for approvals or availability of people</li><li>✓ Lack of automation in build, deployment and integration processes</li></ul>
5. OVERPRODUCTION	<ul style="list-style-type: none"><li>✓ Adding features that are never or rarely used</li><li>✓ Features deployed prematurely</li></ul>
6. OVER-PROCESSING	<ul style="list-style-type: none"><li>✓ «Gold plating» requirements</li><li>✓ Providing features that are not required by the customer</li></ul>
7. DEFECTS	<ul style="list-style-type: none"><li>✓ Defects which are not found in testing and remain in product</li><li>✓ Tooling (<i>e.g. development environments, build tools, version control systems</i>) that does not work, is incorrectly configured or not used as intended</li></ul>

The awareness that waste can be detected and eliminated is key to increasing innovation within the company. If employees put too much effort into work that does not contribute to an increase in value, they may be busy, but they also may be too absorbed or even overloaded to be able to work in a creative manner. In addition, it is especially important for companies in Switzerland, in the current financial situation, to ensure particularly high-quality resources. Last but not least, work which is perceived as unnecessary can be demotivating; however, if employees believe their time is being invested usefully, they are much more open to new thought processes or new perspectives. Converting value-reducing work into value-increasing activities creates the space required for innovation.

Example 1  
CREATING A MORE EFFICIENT PROCESS  
DESIGN USING VALUE STREAM  
MAPPING

A service provider is faced with the introduction of a new ERP system. Projects of this kind are usually complex. An existing system is often long-standing and therefore overloaded with functions, which, although they represent existing processes, may not be required in the new system. In order for the requirements of the new system to be structurally compiled, the company calls in a consultant. This consultant deals with the task as a whole by first initiating an analysis of the business process itself, closely involving the employees who work with the system on a daily basis. The idea is to find out whether the process can be streamlined so that «legacy systems» from the old platform do not hold back the new system from the

outset. In joint workshops with the users of the ERP system, the process sequence is visualised based on value stream mapping. Activities and interfaces are identified in which transfers, questions, corrections or additions take place. The process is adapted for steps where the procedures slow down, waste occurs and where no value is added. As a result of the process redesign it transpires that a variety of existing functionalities are no longer relevant for the new platform because they were introduced as temporary measures or «workarounds» in a gradually inflated procedure.

Streamlining the business process from the ground up can reduce its complexity and thus the extent of the requirements for the new system can also be kept manageable. In this way, efficiency gains can already be achieved before any requirements management or software development has been started. As a result, an ERP system can also be developed which takes up less investment and fewer resources in the backend. These unused resources can be reinvested in the development of innovative customer-oriented solutions.

Example 2  
CUSTOMISING METHODS STEP BY  
STEP TO CUSTOMER NEEDS

A company that specialises in information gathering and monitoring [An information service provider] must deal with increasing customer needs and growing competition. The launch of a new software solution for a customer urgently needs to go hand in hand with innovation. Thus an external consultant is enlisted to initiate and manage the necessary change process for the company to become more competitive. This starts with a review, in





«Preventing or minimising waste is the key which opens the door to all other value-adding activities.»

which he, together with the customer, carries out a capability maturity assessment of the software development process and project management. This fitness test shows clearly that there is scope for improvement in both areas if inefficiencies are eradicated and unnecessary work is reduced. The consultant coaches and enables the company to gradually adopt a leaner, more agile approach in development and process management.

The use of a Kanban board allows the workflow to be visualised and gives a clear overview of the tasks that are pending, in progress or completed. From this perspective, long-term planning (*product backlog*) can be better structured and the features can be allocated more clearly. Regular meetings are held to ensure the exchange of information, to fine-tune planning and to institutionalise the review process. As the delivery times for work-in-progress are deliberately kept short, the exchange is accelerated within the team. The consultant also gains ever-better insight into the company, its culture and the context in which the current project stands. He also acquires knowledge that goes straight back into coaching, adequately reflects customer's specific needs and leads to increased maturity in the processes from meeting to meeting.

Finally, through a retrospective approach and the introduction of productivity ratios, success becomes more visible and measurable. Meanwhile, the process of change has led to smooth and seamless processes in project management and in the software development process. The decisive factor was to combine experience and expertise in the methodology with a step-by-step approach to implementation. As a result of the process improvements, the customer

has been able to optimally allocate his resources while increasing productivity and the quality of work. The employees are highly motivated: The next step will see the new process models also employed at the level of the technical tools due to the fact that resources for further progress have now been freed up.

ERNI – Innovation in Process and Technology



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## DISCOVER

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# CREATING SPACE TO INNOVATE: DIVISION OF LABOUR, SPECIALI- SATION & ECONOMIES OF SCALE

Thanks to outsourcing industrialised processes, resources can be mobilised at the touch of a button – and the mind can be relieved of repetitive burden.

Industrialised processes in software development not only protect internal resources but they can also be more cost-effective and scalable when sourced from a specialised service provider. By doing this, a company's development department has more capacity, energy, time and motivation to focus on its core business: quickly turning ideas into innovations that are successful on the market.

BY PETER ZUBER, CHRISTOPH BRUDERER  
AND CHRISTIAN EICHENBERGER

«Lean software development», as outlined in the previous article, is one possible means of creating space for added value and innovation. Industrialisation in software development is another. Today, the use of software is a given in almost every industry, every company and every business process. But this everyday thing, which we use for software-controlled devices and systems, has a significant impact: If the amount of software in all components and products increases, then they should be distinguished by the fact that ever more intelligent applications have to be brought to the market at an increasingly rapid rate.

For a company that manufactures smart products, the question arises as to how its practice of software development can «optimise» innovation without compromising its core competency in the production of devices, sensors, equipment or other hardware. If a company is aware of its unique competence, it knows what it can do better than the competition – so it should also recognise which innovation step comes next. Despite this, the innovation backlog may fill up because there is often insufficient time in day-to-day business to systematically pursue and process innovative ideas. These are put off, if not completely forgotten about.

In addition, a company also uses different software development teams for various product categories. These teams often work using different methods or use different tools. For this reason, developers cannot be simply transferred from one team with a currently strained resource situation, to another with available capacity. Industrialisation at this level would mean introducing standards as well as unifying tools and frameworks, therefore gaining the use of resources across teams.

But industrialisation is more than just standardisation. Significant efficiency and productivity gains are only achieved by using the additional components of industrialisation: division of labour, specialisation and economies of scale. In this regard, a company must think very carefully about where its core competencies really lie and both what type and amount of resources it can and wants to build up itself. This is because software not only needs to be developed but also tested, maintained and updated. Maintenance itself is often not predictable: If errors need to be resolved quickly in an application, under certain circumstances a software developer will be taken from an ongoing sprint in the development of innovative features. It should be noted that a creative software developer is not necessarily a great tester. Although similar skills are required, a software developer is a real person with his own preferences,

«To put a company's brain into full swing, quickly applicable resources must be added to its process cycle.»







«Innovation vs. repetition: If a company creates innovation, it will hold its own with the competition. If it is worn down through repetition, it will lack the resources, energy and motivation for new ideas.»

a unique view of the usefulness of his work and a personal need for either more routine or more inspiration.

If a company wants to focus on innovation in software engineering, it would be ideal to have brilliant developers whose originality and creativity are not «held back» in repetitive, standardised work.

If a company wants to increase its testing and maintenance teams, it will also face a number of challenges: Firstly, these resources are probably needed urgently, but cannot be found, recruited and trained in a short time frame. Secondly, it may be a case of a one-off project requiring a lot of hard work and corresponding manpower, which, despite being needed at the time, would no longer be used on such a scale after the completion of the project. And thirdly, it throws away economies of scale and the chance of benefiting from a seasoned team with a great deal of experience. Therefore, it is much more appropriate to outsource these services to a specialised service provider. The service provider offers the required skills at the right time to the desired extent and is also able to scale the resources as needed. It is best to choose a service provider that guarantees delivery with a network of near-and offshore capacities, which in turn ensures homogeneous quality standards at all times while optimising costs thanks to the centralised management of this network. Especially in the current financial situation, this last factor should not be underestimated. If the service provider combines on-site consulting and methodological expertise with its experience in implementation, it can also support the company in interdepartmental standardisation. Because a more general process is defined and set up from the initial

idea to the requirements analysis, and then from development to the test and rollout, test and maintenance projects from all departments can be transferred to the service provider using the same pattern. Under certain circumstances, they can also be bundled together, which reduces complexity inside and further increases the economies of scale from the outside.

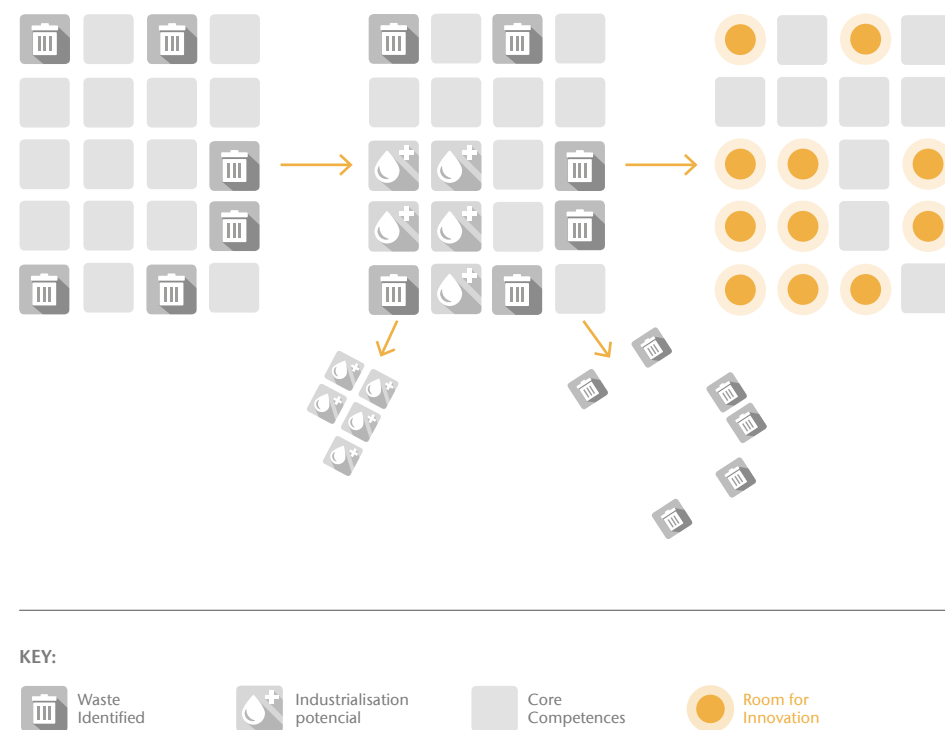
In principle, all repetitive processes that can be standardised, such as testing, maintenance, GUI design, the expansion of existing applications or their porting to other platforms and devices, are suitable for industrialisation in the division of labour with a specialist. These activities may not be innovative in and of themselves, but with the insight which the service provider has in a variety of domains, perhaps one or two innovations can even be identified in these areas which are already well-established in one industry but still new to another. A possible side-effect gained on the way to the main objective may include: helping the company conserve resources and giving its development team the necessary space to implement ideas from the minds of employees involved in day-to-day tasks as well as those from the innovation backlog.

#### Example 1 GOING THE EXTRA MILE FOR THE CUSTOMER, EVEN IN INDUSTRIALISATION

A company in the public environment has to work constantly to keep its tariff systems up-to-date. However, the existing platform, a very complex system with high access rates, is outdated



FIG. 4: MAKE ROOM FOR INNOVATION



«Room for innovation is only created where waste is reduced and the potential for industrialisation is systematically utilised.»

and needs to be replaced. Now that the new system has been designed and implemented, the challenge becomes migrating a wealth of data during operation and updating both the old and new platforms in parallel operation. The content of the data is very closely linked and changes in short intervals in mutual dependency. However, the company does not have the resources to meticulously check whether all of the data from the old system has been correctly transferred to the new system and what changes have to be carried out manually. An internal solution has been discarded because employees of the department would have been bound to this project for too long and too intensively, and would therefore not have been fully available for their own tasks. There is no question of using a separate team as this project is both unprecedented and unique for the company in the long run.

An invitation to tender is submitted in order to find a service provider that can offer both the resources and quality corresponding to the wishes and needs of the customer. Time and quality were the two decisive criteria for the choice of partner: A partner is chosen which can cope with the time factor because it is able to quickly deploy a dedicated, sufficiently scalable team from its shoring centre in Manila; it also fulfils the quality requirement because it manages this team to high quality standards. On site at the customer's premises, a business analyst, as a single point of contact, is responsible for ensuring that the project is properly

set up. The partner puts together the work packages according to customer requirements and develops a tool which accelerates the semi-automated migration of data to the new system and simplifies quality assurance. For the team, it acts as the product owner and a link to ensure that the requirements – which are, after all, to match data in a quadrilingual system and update it in parallel – are properly understood and implemented.

For the customer's software development department, outsourcing repetitive work is a new experience. He can be confident that it is worth entrusting a partner that already has experience in this area and can draw on best practices. The customer does not, therefore, need to worry about the organisation or quality assurance and can get on with his day-to-day core business. It is important for the partner to maintain motivation within the team – although the employees are accustomed to highly concentrated work, the work packages are deliberately varied to break the monotony of industrialised processes. This approach, of not employing mere «resources», but rather, qualified specialists leads to success: The customer expects a 1:1 migration of his data in high quality, however, beyond his expectations, he also receives valuable information on possible sources of errors and additional recommendations for potential improvement. In addition, the ambitious schedule can even be undercut; with the time saved, further quality assurance is achieved beyond what was planned.





«Customers benefit from economies of scale where the success factors: time, cost and speed are aligned with the availability of qualified resources.»

#### Example 2 IN TUNE WITH THE TIMES WITH A MOBILE APPLICATION

A public institution wants to improve its service to citizens. Thus, a portal to register data is to be made available via a mobile app. However, there are distinct challenges with mobile apps, which include the sheer variety of devices and operating systems as well as their short release cycles, which require constant maintenance and updates, thereby annoying the user. Due to this fact the mobile world is not characterised by predictability; in this respect, maintenance within the institution is hardly feasible. Despite employees having other core tasks, they would also have to continuously monitor developments so that updates could be installed, tested and quickly purged of errors in a timely manner.

Therefore it makes sense to entrust a specialist with these tasks. If this specialist has experience and other reference customers with similar requirements, he will already be aware of the relevant technical developments and can then draw from synergies: on one hand in the form of economies of scale, and on the other hand from the fact that the knowledge of potential sources of error can be transferred from one project straight to another. The institution also benefits from its specialised partner's early access to manufacturer updates and from the fact that standard maintenance processes are already established in the offshore centre in order to roll out these updates on time. Once the new operating system is available to the public and users, the app must also be both compatible with it and functional. Ideally an institution or company can and should refrain from building its own resources as they would

then always have to be present and available, but rarely used. Through economies of scale, however, the specialist combines the factors of time, cost and speed with the availability of resources.

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#### DISCOVER

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# INNOVATION «FROM THE BOTTOM TO THE TOP»

As interdisciplinary innovation networks, communities can help take an idea from its conception to its realisation.

Ideas must go through a development process in order to become innovations. First, the ideas need to be extracted from the minds of employees. However, the exchange of knowledge and experience does not just happen; it requires targeted support and suitable platforms. Companies that want to tap into their «brain» accordingly, and make it productive, can benefit from best practice.

BY JAZZ KANG

The previous article discussed the fact that many creative ideas are already in the minds of employees. In their daily work, they apply their knowledge in practice and gain experience of what works and what could work even better. Streamlined processes and relief from routine tasks pave the way for more motivation and reflection. New ideas only arise when the familiar is called into question – when people plan ahead and think laterally. The first response when it comes to lateral thinking and change is often to be defensive, with «It's always been done like this» as the standard mind-set. But resistance to change does not push a company forward, let alone to the top.

For ideas to flourish, they require a culture which also welcomes unconventional approaches. It is only natural that not every idea automatically leads to innovation: Innovation will only result from an idea when new products, technologies or processes have been both implemented, and successfully applied and accepted on the market. The major challenge is therefore to separate the wheat (*future innovation*) from the chaff (*unsuccessful ideas*). To this end, it is necessary to first understand the process which an innovation must go through from conception to its realisation.

Thus, in the words of Goethe in Wilhelm Meister's Journeyman Years: «Knowing is not enough; we must apply. Willing is not enough; we must do.» A culture of

innovation must be actively promoted. At each stage of the innovation process, appropriate platforms and situations must be created that will help stimulate ideas, develop them further and, ultimately, to turn them into innovation, i.e., to be formally incorporated and marketed in the company's product or service range.

The creation of communities serves to properly channel this creative energy to ensure that its innovative power is exploited step-by-step. Cross-area and intercompany networks of this kind are a powerful tool for companies to both generate and exchange knowledge, to experiment and to develop ideas.

Even if willingness is present in a company to let employees (*inter*)act in order to generate and develop ideas in communities (*the so-called «from the bottom to the top» method*), the establishment, maintenance and support of these networks requires considerable commitment. Methodical external monitoring, by a consultant, helps set things on the right course and keep them there by drawing from best practices. The consultant knows about the various phases of the innovation process; provides the methodical tools for knowledge management and combines this with adequate incentives for refining the ideas in the process.

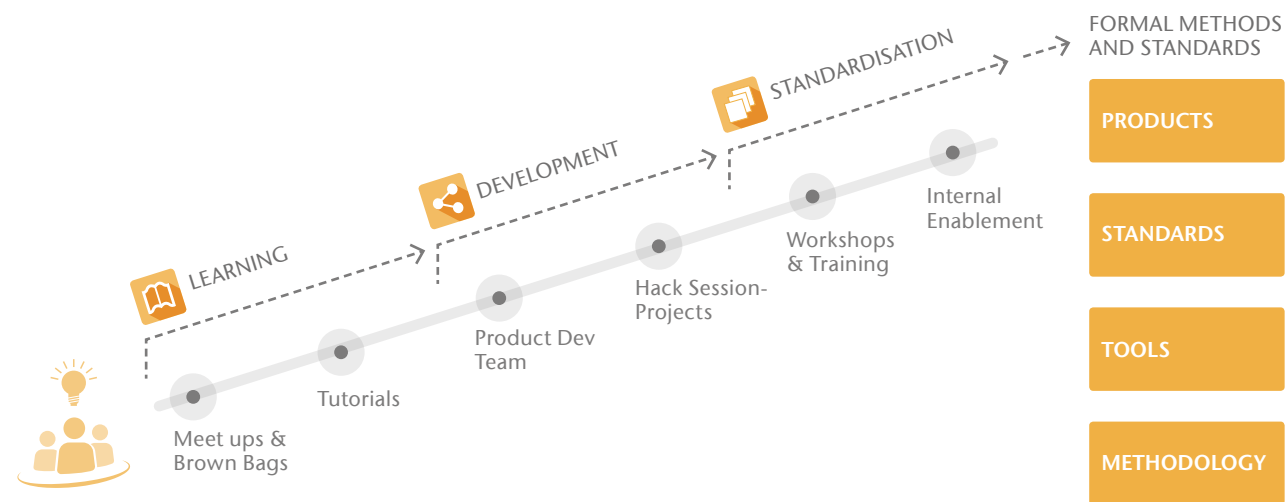
The innovation process usually consists of three phases. First, ideas need to be collected and exchanged. In this phase, the focus is on establishing a learning



«Not every idea is worth being developed further. But every idea is an investment in a potential future innovation.»



FIG. 5: DEVELOPING A «LEARNING CULTURE» THROUGH A COMMUNITY?



«If an idea is constrained too early on by structure, it might die; if you're too late in being proactive with it, you may lose out on the market because the competition was faster.»

culture: Employees should be encouraged to share knowledge across their own desks, to take on board others' knowledge and to use it to broaden their horizons. This learning and research phase does not require much structure at all. On the contrary, the more relaxed and enjoyable the information exchange, the bolder the ideas – which may and should deviate from the norm. Ideal situations are «meet-ups», or so-called «brown-bag lunches», where a laid-back learning process is initiated, which is supplemented and promoted through tutorials on defined but interdisciplinary topics.

Even if many of the ideas from this first phase do not takeoff, an engine is started, which is fuelled by motivation, joy of gaining new knowledge and the unfolding of the employees' own creative forces.

In the second phase, ideas which are deemed worthy of being further developed are chosen. As before, the focus should be on experimentation, yet here more care is given to «sounding out» thought constructs for their feasibility. This stage requires enough structure so that cooperation within the communities is promoted, a certain measure of success is ensured and the conception of an end product with customer benefits can already begin. To do this, an environment for practical work and training needs to be designed. However, it must also allow the human play instinct to be indulged such as in the case of so-called «hack sessions». Additionally, a product development team is assigned to the individual project teams both as coach and helmsman, pays attention to the usability of the output and structures its «productisation», i.e., the formal transfer to a product or a service.

Here, the developed and accepted idea enters its third stage: Once it has undergone a series of experiments, feedback loops and evaluations that certify its potential success, it must be added to the company's product range according to the default standards. In order for it to become a commercially viable product or service, it must include a clear value proposition, be documented and be established as a new standard in the corporate system. The community thus faces two hurdles in this phase: It must be able to prove to management that its innovation is marketable and demonstrate how the organisation can market its innovation. These two challenges can be addressed in either a «Community@Work» or formal workshop.

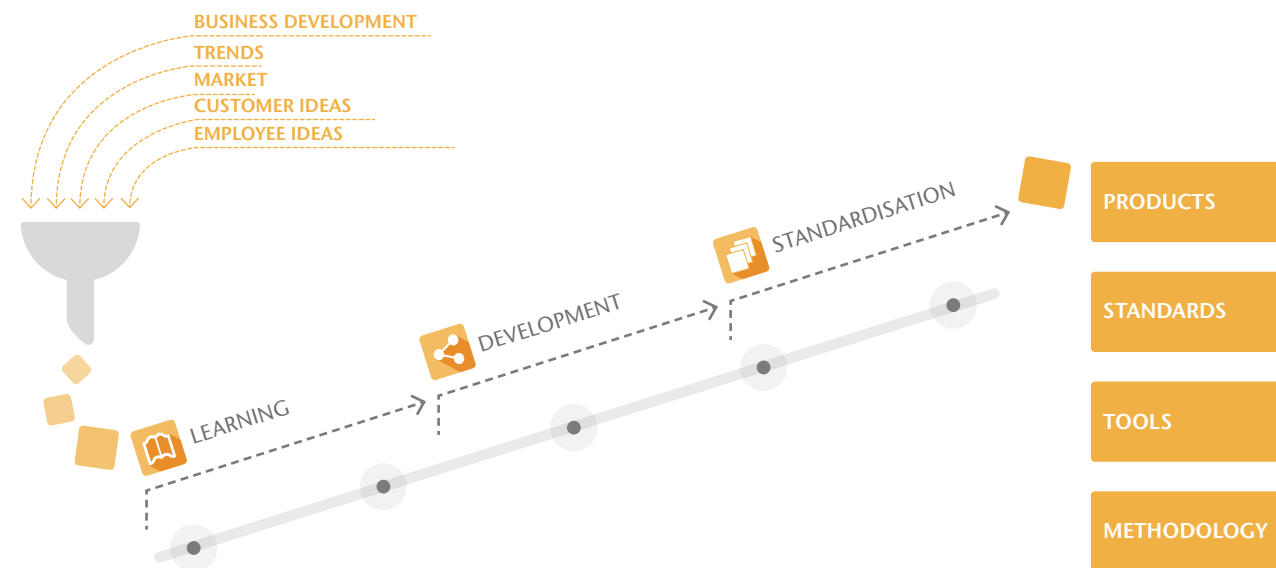
In this process, it is essential to identify and install appropriate moderators for each type of community. Does it ideally call for a networker, who brings together and motivates the employees? Or, is an organiser required, who draws up appropriate structures, operationally controls the process and creates the platforms which promote the idea during the development and acceptance process?

Innovation is a creative, sometimes unpredictable process that nevertheless requires control. If an idea is constrained too early on by structures, it might die; if you're too late in being proactive with it, you may lose out on the market because the competition was faster.

Everyone wants to be innovative, but testing established products is not everyone's cup of tea. It is important to involve employees at every level of the company in the innovation process. For this purpose, it helps to understand the «community»



FIG. 6: THE THREE PHASES OF INNOVATION: LEARNING, DEVELOPMENT AND STANDARDISATION



«Employees seek exchange and are willing to learn. If they are encouraged to do so, they will develop enormous creative energy – to the benefit of the company's innovative power.»

tool and to use it for the benefit of the company. Best practices are available and can be increased with experience and methodology.

#### Example 1 STEP BY STEP TO INNOVATION

A service company would like to promote its internal learning culture. With the help of a consultant, it begins to create platforms for employees to exchange and expand their knowledge. It is best to allow a certain freedom, so that they are care-free about their involvement in corporate knowledge sharing, and with time, will recognise its value for themselves, for their own professional development. Once the community has gained motivation at the level of informal knowledge exchange, the newly-acquired knowledge needs to be put into practice and tried out. With this momentum, the first «hack sessions» are established, where employees can develop their ideas through experiments. On the advice of the consultant, at this stage a product development team is also installed, which supports the community, documents progress in the conceptualisation process and manages the individual innovation projects. With this new community structure, more and more employees become interested and involved. The product development team also makes sure not to neglect the «fun factor» – combining business with pleasure.

When initial results start to emerge from the practical testing of ideas, the formalisation process begins. For methodological reasons, but also for the parties involved to be able to see their ideas growing, new approaches are documented and included in the standard repertoire of methods and practices. For this reason, two platforms are set up. The first serves in terms of marketing the innovation, where the information is processed adequately for marketing purposes. The second platform is aimed at enabling more employees to master the innovation and to spread information about it within the company. To further reinforce these community platforms, events are initiated regularly, for example, a weekend «hack & hike» – a get-together in the mountains with a morning brainstorming on further developing the innovation to the stages of design and implementation, followed by a relaxing hike.

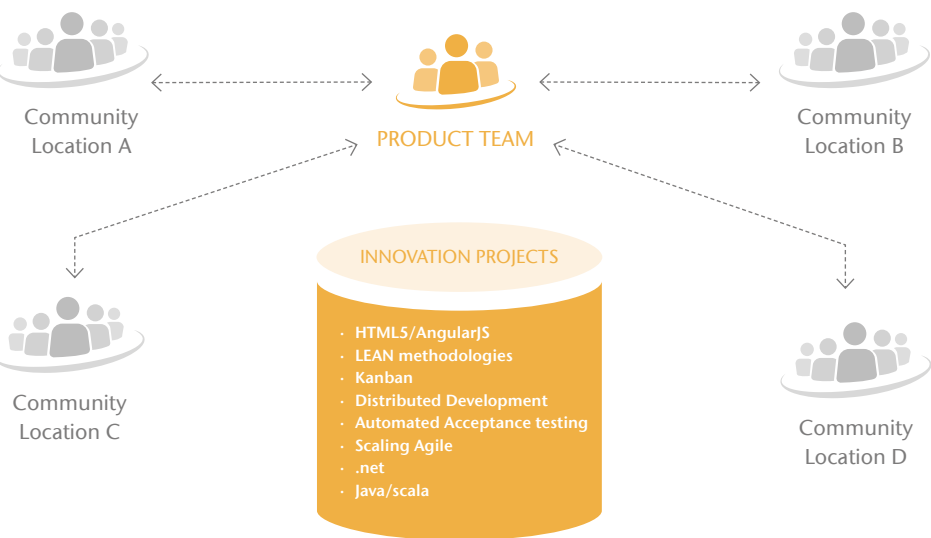
#### Example 2 INTERNATIONALISATION OF THE INNOVATION PROCESS

An international service company wants to promote the innovation process internally and to integrate all of its sites into the process. The challenge is to draw innovative energy from eight countries with a total of twelve branches. The classic method of meeting up to establish a community is hindered by different work-life styles needing to be balanced:





**FIG. 7:** ENABLING COMMUNITIES TO SUCCEED THROUGH A COLLECTION OF PLATFORMS THAT CHANNEL IDEAS THROUGH OUR INNOVATION PROCESS.



In some countries, it is preferential to exchange knowledge throughout the day, while in others, an after-work platform works better. The enlisted consultant adapts the platforms to the situation: At some sites, brown-bag lunches are organised, and in others, evening events with informal get-togethers are arranged.

The tension between global and local innovation promotion is also taken into account in the development phase: Keeping in mind the relevance of a technology for the market, each site is free to set up tutorials or hands-on sessions. From there a centralised product team is installed. The aim is that superordinate function structures innovation projects and clusters them into smaller product development projects. This allows developers from an international network to get involved. This helps to establish the foundation needed to experiment with project methods across international locations. For example different agile teams are working on different aspects of a product up to the point where all developments can be integrated into a single release. This allows a doubling of the value: Employees work creatively, becoming more confident in interdisciplinary cooperation.

Global events are organised in order to further strengthen the communities: As part of the «Global Hack Day», engineers work together via video conferencing on product ideas in separate development teams from different countries. The result is some original and very practical applications. It is not just a question of approach or technology, but also of getting to know each other better or «just for fun» activities, such as a «Random Lunch Application», which puts employees together randomly so that they can eat lunch together and, as

an added service, also lists all of the menus of the restaurants in the surrounding area. The event is a great success and inspires motivation, enthusiasm and the desire to push forward.

In the standardisation and formalisation phase, analogue global platforms are used for education and training. In addition, a system is installed that informs proactively interested and directly affected employees about new developments and encourages them to register immediately for the next training session.

Through the different phases of the innovation process, the consultant succeeds in prompting emotions, strengthening cooperation and achieving the overall objective – strengthening the innovative power of the company as a whole.

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Advisory Activity: Agile Software Engineering, Automated Testing Expert and Learning Culture



# IMPLEMENTING INNOVATIONS QUICKLY

Rapid availability of scalable resources and focussing on the essential – so innovations reach the market quickly.

Three factors are crucial for a short time to market: Qualified resources need to be made rapidly available; the processes must be streamlined and agile, and the decision-making process must be short; and last but not least, it requires the courage to experiment. If the partner also masters methods that further speed up the development process, the innovation gains a high probability of success.

BY OLIVER BLINDENBACHER  
AND PHILIPP LEHMANN

Every innovation has its time. Only those who present the customer with their innovation at the right time gain a share in the market. This requires short development and rollout times – a short time to market. For this reason, it is also important that companies give their development departments the time and space to build up their energy and creativity through «lean thinking» and industrialisation – as described in the first two articles. It is no use just having creative ideas; they also need to be implemented quickly. Resources also need to be made available for this – and indeed qualified – under certain circumstances at short notice and, if necessary, scalable.

As seen in the tense situation within Germany's IT profession, partners are driven by considerations such as how high-quality resources and cost pressures can be reconciled. A partner serves to guarantee deliverability via a globally distributed shoring platform: Using its network of service centres, it is able to very quickly assemble highly qualified teams with broad experience, focus on onshore consulting and even speed up the development process nearshore or offshore. Process acceleration, however, is only effective if it is based on the right methodology. The use of agile practices, with their direct effect on the scope of the result is obvious. A bi-modal process model can often be useful; it ultimately makes a difference whether a business-critical

system or a mobile app is in the development pipeline.

The speed of the process can be maintained if decision-making processes are kept short and the competence and authority to make approvals are established in direct contact with the development partner. For this, the customer must receive results in the shortest possible cycles, so that he can intervene and better direct the result in the desired direction. This in turn necessitates that the customer and partner have come to the same understanding of the underlying requirements and the resulting framework: How are requirements weighted in terms of availability and maintainability, if it is a case of marketing an innovative product as quickly as possible? If the internal development departments are standardised on durable technology stacks, then the partner may be ahead of the game in terms of flexibility and agility to reduce the time to market. This is important because if setting up the frameworks or configuring the development environments takes too long, valuable time is lost before any concrete work on the innovation can even be done.

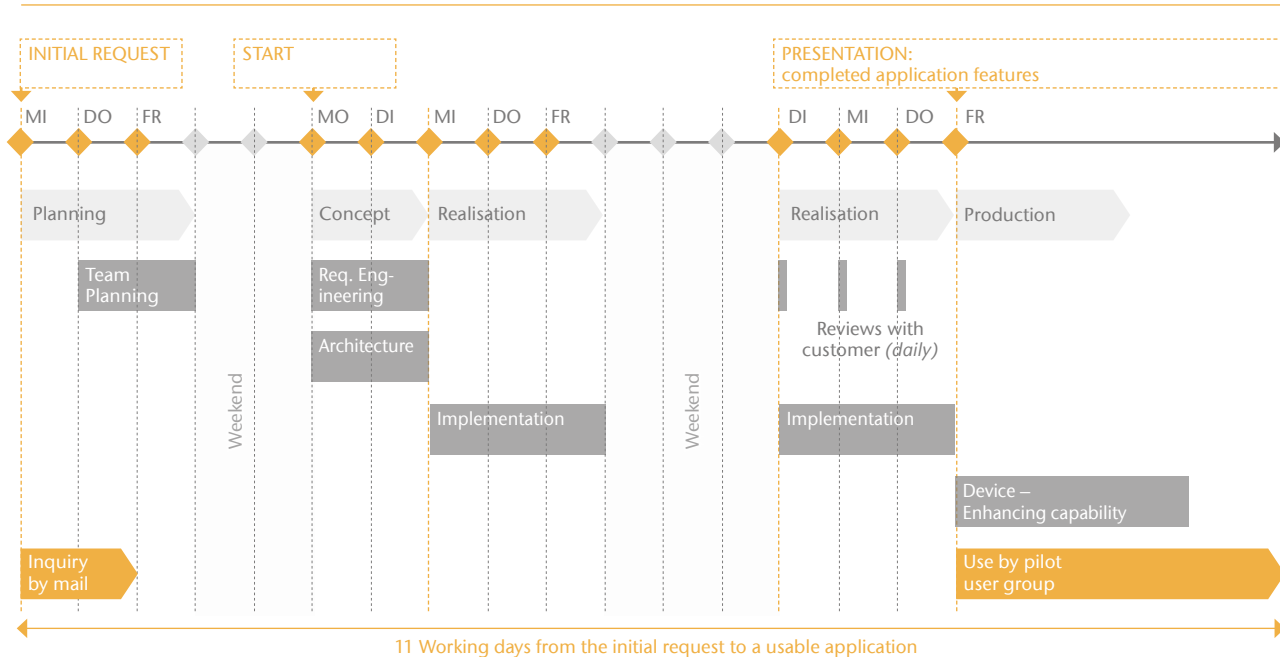
This is also the thinking behind the «courage to leave gaps» principle, as reflected in the «minimum viable product» (MVP) concept. In the first step, the target audience for a first product version or MVP, needs to be defined and given boundaries. The aim should be to only integrate features and functions that will be needed (*by default*).

«A short time to market is of critical importance for a successful market launch of Web and Mobile applications. Trust a partner who has internalized this dynamic.»





FIG. 8: PROJECT DEVELOPMENT



This ensures that the customer group will get real value from the product. An MVP approach is usually used outside complex, longterm, system environments and development stacks. Thus, the technical foundation should consist of lightweight technologies and scripting languages, as well as the use of frameworks that already deliver basic features and further enable rapid development. An additional simplification that leads to acceleration in the development process can be found in publicly available APIs similar to those that Google and facebook offer for user identification. For production and hosting, large cloud hosts can be leveraged for convenience. These allow a limited target audience to

set up a whole range of development tests and production environments for a low investment and within a short period of time. On top of that, platforms like this can be easily scaled if the number of users is increasing or if new geographical markets need to be addressed.

As already stated on this subject in issue 61 of EXPERIENCE, MVP is based on the idea of putting a commercially viable product on the market as quickly as possible and allowing market feedback to flow back into the development of the product just as quickly. That is why an MVP is a very efficient tool in checking how the market reacts to an innovative idea, one with the shortest possible time to market!

«Strong delivery capability, in combination with international quality standards, are the foundations for a successful realisation phase and are necessary to introduce innovations to the market in a short period of time.»

The concept is not without risks (*potentially in the form of unfinished products that are rejected by the market*), but it fosters a mind-set that is essential for innovation: the courage to experiment, to try and to think freely.

For the risk assessment, a company should be able to count on its partner: How responsibly does it deal with these risks? The point should not be to reduce time to market at any cost. Does the partner have sufficient resources to be able to deliver as quickly as was promised in the process model? The partner's ability to deliver – from anywhere – is absolutely essential if an MVP is to play to its strengths. And finally: Does the service provider guarantee quality, even when under time and cost pressure? This requires a partner that uses uniform quality standards across all of its sites.

#### Example 1 THE DEVELOPMENT PARTNER AS PROTECTION

A large corporation requires, at very short notice, an application for sales support on mobile devices, mainly tablets. A first version is to be presented within ten working days of the decision and the first contact with the partner. The customer knows his partner from a past development partnership and trusts that it is in a position to meet such ambitious targets. The partner promptly

compiles a complete development team in its offshore site in Manila consisting of highly qualified software engineers, user interface designers, software architects and testers. At the customer's site, an employee is responsible for documenting the requirements and remotely managing the development team. For the development environment, the configuration option that promises the highest degree of efficiency is selected. Setting up the environment in the cloud of a leading internationally Managed Cloud Host takes just a few minutes. An equally efficient scripting language is used for programming. Taking a highly agile approach, the focus is on the essential functions in the sense of a «minimum viable product». On the desired presentation date, the application is at a stage where it can already be used by the target user. The costs are in the low five-figure range. The customer is very satisfied and impressed by his partner's rapid responsiveness. Following the successful presentation of the first version, only optimisation work is carried out such as the improvement of the responsive design or adaptation for other devices.

#### Example 2 IN TUNE WITH THE TIMES WITH A MOBILE APPLICATION

A professional app provider has a very creative idea for a location-based search application on mobile devices, which it is having patented due to the unique nature





«In order for a new idea to become an innovation, you need the ability to react quickly throughout the entire development process: beginning with the mobilization of internal resources, all the way through to leading a development team on a short-term basis.»

of the operation, design and ease of use. The dynamic app market calls for rapid implementation and marketing. For this, the company relies on its partner, which quickly mobilises a development team at its nearshore centre in Barcelona and supplies a contact in Switzerland to document the requirements.

The first graphic designs (*mock-ups*) are created and, together with the customer, ideas are designed on a flipchart, which are then visualised.

For the implementation of the app, the possible functions are listed (*product backlog*) and enriched with the visualisations. The functionalities are prioritised in such a way that each one is assessed for its value to the end user.

Thanks to an agile development process with mere one-week sprints, the customer receives a running application directly on his smartphone every week (*according to the sequence of prioritised functionalities*) which he can test there. User concepts are quickly tested and the design is refined.

With its clear focus on the added value for users and the corresponding prioritisation of functions, the app can already be offered to the community after a few development cycles. Through the downloading and use of the app, user feedback flows directly back and either creates new ideas or gives pointers for improvement potential in the functions. The proposals and recommendations are included in the product backlog. These sometimes lead to new functions, or sometimes existing functions are replaced. In this way, the app is continuously optimised for customer benefit and the community

is «brought on board». The short development cycles lead to an extremely reduced time-to-market. The customer is faster than the competition to the market and wins the community through lively interaction and the acceptance of its ideas. classic win-win situation for the provider and its customers.

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