AdNovum

Welcome to Software Industry 4.0

Next to the Internet of Things (IoT) and Industry 4.0, digital transformation
is one of the biggest trends in IT. It has a decisive influence on our customers' business.
But not just theirs.

By Tom Sprenger and Christian Widmer

As an independent provider of software solutions, we have noticed significant changes in the market in general, but also specifically for our customers. The key driver in this global trend is a digital transformation wave that impacts all industries. In order to stay competitive in their markets, companies must completely rethink business models and find new approaches at a previously unimaginable pace. The expectations of end customers, for example, have radically changed how they communicate with companies. End customers today expect mobile access to offers and an active exchange. They see themselves as a community on equal footing with the company and increasingly want to be involved.

The speed of these developments constantly challenges our customers in preparing the IT solutions necessary to solve these issues. "Bimodal IT" or "multispeed IT" approaches are highly effective. Gone is the time when IT was just a cost item. Modern technologies (e.g. mobile and cloud) and approaches (e.g. DevOps and continuous deployment) in IT are uncontested as being among the most important factors that enable it to react quickly to dynamic customer needs and new market trends.

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Agile collaboration and planning security

In consequence of these developments, collaboration with our customers has drastically changed. The need for agile collaboration has increased rapidly. Before, the customer hired us on a classic waterfall-oriented contractual basis, sent us a set specification, and expected to get the completely developed solution

by the contract deadline. Today, our customers already want us on board during specifications of the solution and throughout development so that they can continually adapt their course to new circumstances. At the same time, our customers' need for (planning) security has increased. In other words: Our customers want a software delivery process that unites agility, which is necessary for the development of individual solutions, with the core characteristics of a highly industrialized production such as planning security, reproducible quality, low production costs per release, and speed.

The need for agile collaboration has increased rapidly.

Consistent digitalization as differentiating feature

This is precisely what we do at AdNovum: We want to offer our customers the option to bring new solutions to the market in a highly agile yet secure way. This requires a systematic digitalization of software development from the customer's request to delivery. The end-to-end digitalization will be decisive for us as a Swiss software company over the longer term as we aim to meet growing market demands. For us, it is an opportunity to differentiate ourselves in the market and to prepare ourselves for an increasingly competitive international arena.

Stepping into the digital software delivery model

As a prerequisite for successful, networked projects in a distributed ecosystem with customers partners, two key elements must be fulfilled: All participants need location-independent access to the same information base. But the customers as well as the partners must also have access to the important processes of collaborative projects and be able to participate actively.

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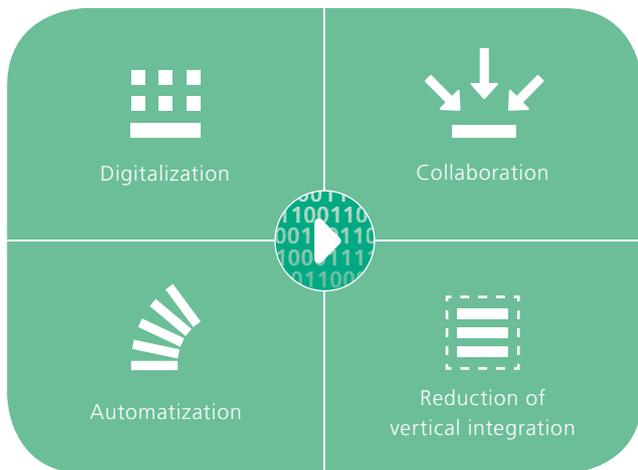
The digital software delivery model.

This is a direct analogy to digitalization initiatives in the finance sector, for example, where end customers and consulting partners now get digital access to a bank's business procedures in order to transact business in direct dialogue with it.

The digital information model is key

Location-independent availability and shared access to procedures necessitate systematic change in a digital software delivery model. One such model essentially consists of two main elements: a digital software delivery process and a digital information model. The first one defines the processes of important tasks and production steps from customer inquiry to delivery of the solution. This process can have various charac-teristics, depending on the customer's project. The variation in

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this case is indiscriminate. Important for the process are a clear definition, digital mapping, as well as a solid grounding within the project. The digital information model is decisive for the success of a digital software delivery model, which means that all deliverables are archived digitally and in a structured way. All process artifacts and deliverables like requirements, speci-fications, GUI designs, and tasks are digitally created and managed. This sounds almost trivial in today's climate. But practice shows that the model is far from being implemented digitally from end to end. Today, physical documents (e.g. speci-fications) or other artifacts are still occasionally exchanged.

Tom Sprenger: as CTO in charge of the digital strategy.

Extracting important information

Still, even if all artifacts are digitally archived, that does not mean that the digital information model has been systematically implemented. Digital transformations often fail because, despite a digital flood of data, the really important information cannot be extracted. A central part of every digitalization strategy is to create value from data available after the transformation in order for an existing business to become faster or better and to

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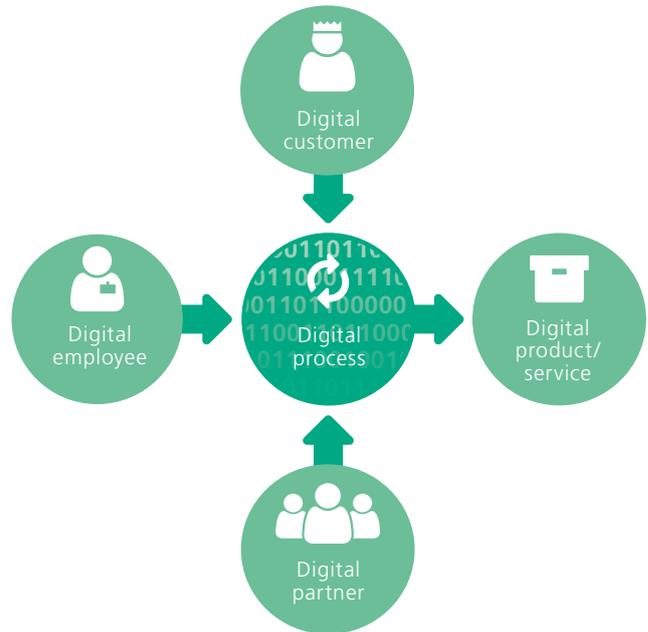
The digital business process.

Customers and partners: getting in on the action instead of watching from the sidelines

The digitalization of process and information models is the prerequisite for collaboration in the project ecosystem across different sites and organizations. Any information that is relevant to a project is accessible at any point to any authorized person from any location. The physical presence of certain persons is no longer mandatory for successful project execution. As equal actors in the project-related and highly networked ecosystem, customers, partners, and AdNovum work together on a virtual collaboration platform that draws on the digital process and information model.

Such a collaboration platform includes all the functions that are necessary for digital software delivery and also offers far more than the usual collaboration services such as mail, chat, task management, and wikis. It enables completely new forms of work, such as the joint development of new solutions, also known as cocreation. Customers no longer receive a turnkey solution that covers predefined needs, but rather the opportunity to play an active part in the development of the solution. Along the way, they profit from the development company's know-how, which is based on similar projects, particularly regarding customized project methodology and best practices.

Cocreation creates transparency and eliminates barriers

Collaboration in digital environments brings change and ultimately also requires adjustments to the procedural landscape. The classic customer-contractor relationship disappears in favor of significantly more transparent and ultimately more productive

implement new business models. We are particularly interested, for example, in how many iterations we must run through during testing until we have met the desired quality standard. This shows where we must start in order to achieve improvements. Or, we want to find out whether services with reuse potential were implemented anywhere in the code, such as services for sending mail. Through the consistent reuse of such services, we can shorten the time-to-market.

work forms like cocreation. By using modern identity and access management mechanisms, like the NEVIS Security Suite offerings, the explicit differentiation of internal and external from the participating organizations increasingly disappears. All participating parties can be equal in the project and can work together seamlessly across organizational boundaries.

Practical experience with customers shows that cocreation approaches significantly increase speed, particularly during phases of great insecurity. At the beginning of a project, for example, when the requirements are not fully established or only a vague idea of the desired solution exists. With a collaborative model-assisted approach, the knowledge of all participants can be used in this phase and can have a direct impact on the result. But initial results (e.g. GUI flows) during the implementation phase can also be demonstrated early and easily in the collaborative environment. Feedback on the process is immediate. Consequently, undesirable developments can be recognized and corrected early on and iteration cycles toward further development of ideas and solutions can be dramatically shortened. As a result, the time-to-market from the idea through implementation and on to the productive introduction is reduced as a further effect, which in turn lowers development costs.

With cocreation, feedback on the process is immediate.

Digital information generates added value

When all artifacts produced in the software delivery process are stored in the model, they can be constantly analyzed without additional expense, enabling continuous improvement. Manually created artifacts, such as specifications, project structures, source code or entire infrastructure landscapes, offer the most effective lever regarding optimization. In the process, one can differentiate between artifacts that necessarily require creative output and those that are redundant or derived from available artifacts and can thus be treated as technical busywork.

In order to sound out idle automation potential, we can first use information from the digital software delivery model. To this end, we determine only tasks without creative features in the model and then generate successive artifacts from semantically annotated artifacts. Architectural basic elements, for example, can be extracted from a business specification and can produce automatically from that the project-specific scaffolding of the solution architecture as well as the ground structure of the software project and its system deployment. At this point it must be explicitly noted that it is not about generating business logic – this requires in most cases creative capacity and is not subject to the classic generator approach.

Christian Widmer: in charge of the regional strategy.

Reducing vertical integration

The production of artifacts requiring creative output is linked to brainpower and, ultimately, to certain persons. Their production is only partially scaled and they are commensurately valuable. Today, such artifacts are often still created and filed on paper or in proprietary formats. In a digital software delivery model, they are always available in a digitally itemized form and semantically linked. New possibilities open up in this

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Digitalization frees up resources

The consistent digitalization of the software delivery model enables new, more efficient forms of collaboration and an additional automation for redundant and creative tasks. It liberates resources and simultaneously increases agility in the project. It becomes significantly easier to test innovative approaches within a project while closely collaborating with a customer. This way, constant innovation can be promoted without great risk.

Consistent digitalization liberates resources and increases agility.

Nike shows us the way. Customers can order customized Nike shoes (NIKEiD) online. Nike is combining a highly automated production process with a customization. In the industry this is called individual mass production and digital fabrication. Stepping into a digital software delivery model provides the basis for analogue options in the software industry and enables both us and our customers to quickly seize new market opportunities. In addition, it lays the foundation for innovation, i.e. for completely new offerings – welcome to software engineering 4.0! ■

Tom Sprenger

Tom Sprenger, Dr. sc. techn. ETH, joined AdNovum in 2000 as Software Engineer. From 2002 to 2004 he was Head of AdNovum Software Inc. in San Mateo, CA. In 2007, he was promoted to Chief Information Officer (CIO) and member of management. In this function, he built up the strategic business area IT Consulting. Since 2013 he has assumed responsibility for the company's technology strategy – with a focus on digital evolution – and business unit products in his role as Chief Technology Officer (CTO). In his private life, he enjoys spending time with his family and, in the winter, sunny days on the slopes.

Christian Widmer

Christian Widmer, MSc. ETH in Computer Science, has been with AdNovum since 2002. He had the technical lead in various complex enterprise projects. In 2010, he moved to Singapore to help build up AdNovum Singapore Pte. Ltd. As regional CTO, Christian Widmer has been responsible for the definition and implementation of AdNovum's strategy in the Asia-Pacific region since 2013. Outside AdNovum he, as a passionate dad, enjoys spending time with his family.

process. Similar artifacts, including their context, can be made visible and available using corresponding tooling. It is possible to merge prefabricated components from an existing service repository while creating a new solution. Reducing vertical integration can enable extensive avoidance of the repetitive creation of same or similar artifacts. This frees up valuable creative capacity and brings a higher added value to another area.