USU

White Paper

AI-Powered IT Service Management

7 use cases for your IT support

Content

Introduction

Artificial Intelligence in Service Management

High-performance ITSM tools automate IT service management and make it more efficient. They are therefore pre-destined for application in the area of artificial intelligence (AI). At this point, it is far from just a pioneer project or concept sketch. Moreover, numerous use cases are showing a significant increase in the performance of ITSM products once again. They take advantage of the ability of algorithms to emulate intelligent behavior. In so doing, they learn from the past and draw conclusions from it.

While ITSM tools were previously used a mostly fixed set of guidelines to automate tasks, AI determines the rules itself and because of its computing power it is superior to human intelligence. IT can perform service management tasks more safely, more quickly, and more efficiently. We'll show you in the following pages just how that works in detail and give you a little taste of what is still to come. The potential of AI in ITSM is far from exhausted.

The Hour of AI

The history of AI reaches back to the middle of the last century, but high-performance solutions have only been available in recent years.

Highly and easily scalable computing performance as well as the means for economically saving large quantities of data forms the framework in which algorithm-based forecasts can play out their full potential. In the meantime, many convincing use cases have evolved. In ITSM, they refer primarily to the abilities of AI to process large quantities of data and to recognize correlations, similarities, and patterns within it.

Potential: what you can achieve with AI

With AI, service management responds primarily to essential challenges. First and foremost is higher productivity. The Service Desk is subject to an immense volume of data and requests, but algorithm-based applications handle many of these decisions. As a result, it can draw conclusions from millions of datasets. AI can take care of repetitive, tedious, and unpopular tasks better and without complaint. Capacities for higher-quality work are opened up that would otherwise go untapped. In addition, employees with lesser qualifications can take over more challenging tasks with the assistance of intelligent applications.

AI in Practice: Use Cases in ITSM

AI-based ticket routing

AI-based ticket routing automatically classifies user tickets like outage reports, orders, or user requests and assigns them to the proper service employee. In so doing, the time-intensive manual analysis and determination of ticket class, urgency, effect, and suitable operating group is omitted, which previously had to be done by someone from the Service Desk (“dispatcher”).

In order to implement this, what are known in the field of AI as “neuronal networks” are used (see Fig. 1). The structure of these networks is similar to the human brain, and the algorithms are based on their functionality.

Neuronal network in the field of AI

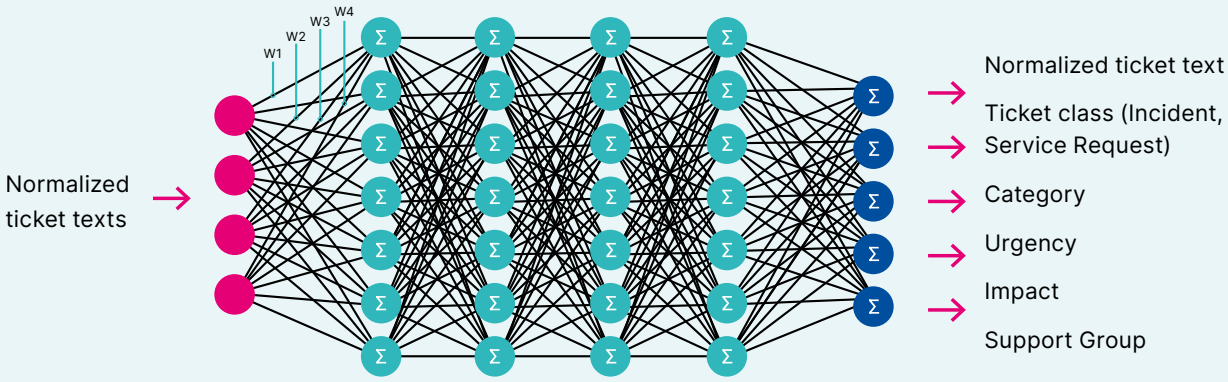


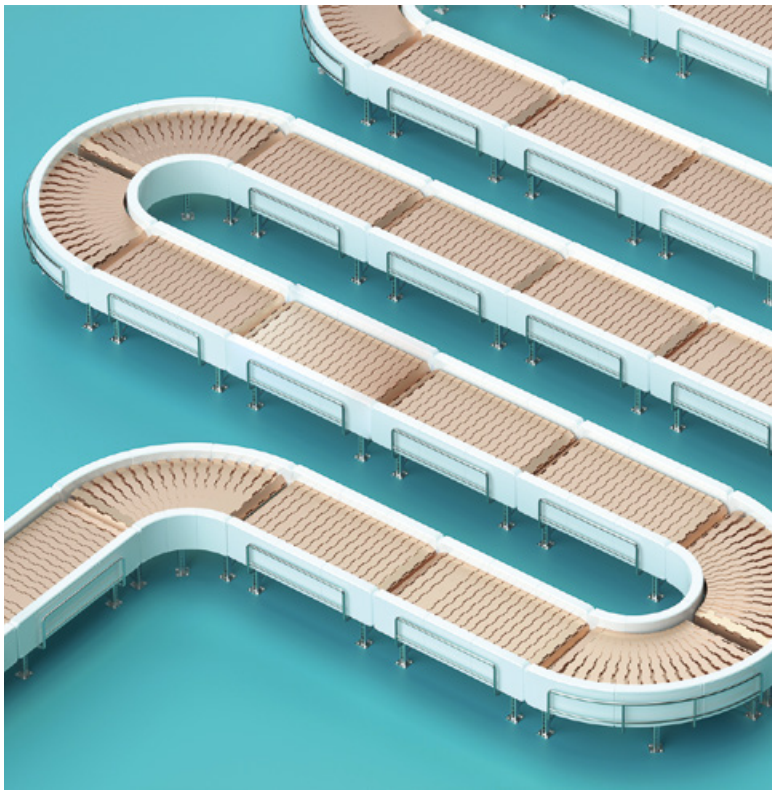
Figure 1: Using similarities, the neuronal network allocates the tickets to certain categories.

To do so, first the irrelevant words (such as “the”) are filtered out of the ticket text used to gather information, and the remaining text is converted into normal form (e. g., “interrupted” → “interrupt”). The ticket components normalized in this manner are added to the input of the neuronal network, which is composed of numerous layers of networked nodes (neurons). The neurons weight each input value with an individual factor, total all the weighted values, and forward the result in the network to the next neuron level. The last level consists of five nodes that contain the queried values for the ticket class, category, urgency, effect, and operating group.

In order for the proper result to be output, the network must first be trained with the help of the deep learning process. In so doing, historical and correctly classified tickets are fed into the untrained network, and the result is compared with the desired result. Depending on the size of the deviation, all weighting factors in the network are modified step-by-step, and the process is repeated. This process is continued until the result corresponds with what is desired. The “memory” of the neuronal network is then saved in the properly configured weighting factors.

Now the network is ready for operational use, meaning newly received tickets are reliably classified. In addition to the searched-for classification values, the neuronal network also delivers a “confidence” value which indicates how reliably the AI was able to complete the classification. If this value falls below a certain threshold, the AI marks the corresponding ticket as not automatically classifiable. In this case, a Service Desk employee must manually assist. Because training the network has to be repeated at regular intervals, the manually classified tickets are included in the next round of training. The percentage of automatically classified tickets grows continuously.

In practical use, more than 90% of all tickets can be automatically classified. Unlike a rule-based routing algorithm, no manual adjustment is needed when AI is used, for example when tickets suddenly crop up due to new services or new types of malfunctions. AI trains itself continuously and thereby automatically adapts to the new types of tickets. Depending on the size of the company, this can quickly save several hundred thousand euros annually.



AI-based master ticket creation

In the case of a central malfunction, many users report the same malfunction to the Service Desk. In order to process all the reported incident tickets together, they are assigned to what is called a master ticket. If the malfunction is remedied with the master ticket, then all assigned tickets are closed automatically.

AI can also provide automated assistance for this process. It analyzes tickets that are received at short intervals and detects similarities in the individual tickets. If there are many similar tickets within a short amount of time, then the AI assumes there is a central malfunction and suggests that the Service Desk employees create a master ticket. If this is accepted, the algorithm automatically creates a master ticket from the first ticket and assigns all subsequent similar tickets to it. For as long as the malfunction remains unresolved, all new similar tickets will be automatically assigned to the master ticket.

Master ticket creation

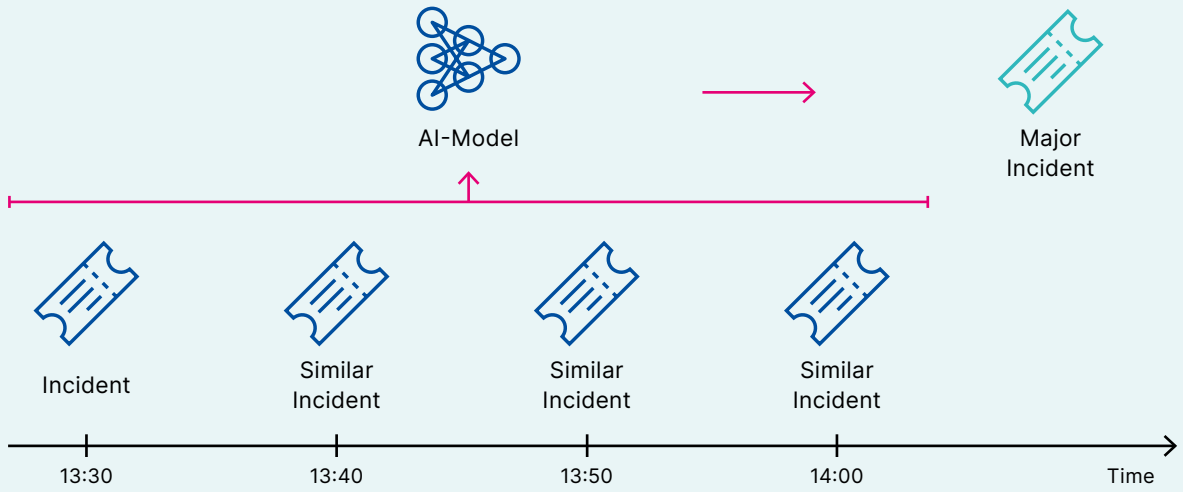


Figure 2: AI-based master ticket creation

As with AI-based ticket routing, a neuronal network is used to detect similarities. If the confidence value for the similarity determination is above the upper threshold (e. g., 90%), the master ticket assignment occurs automatically. If the confidence value is below the lower threshold (e. g., 50%), then no assignment takes place. If the value is in between, the Service Desk employee is notified of the similarity and is asked whether an assignment should be made.

The advantage of this AI-based process is obvious. Mass outages are detected quickly and reliable, and the effort to process many tickets is significantly reduced. The automatically detected mass outages can be displayed in the self-service portal so that the users are well informed and don't need to enter any additional identical tickets.

AI-based problem management

If the same closed incident tickets arise over the course of a longer time period describing the same malfunction and attributable to the same cause, this indicates a more extensive problem that has still not be definitively resolved. For example, a computer crash can quickly be fixed by restarting the computer. However, if crashes continue to occur frequently, the cause must be investigated. For a detailed analysis and final correction of the cause of the malfunction, the Service Desk usually creates a problem ticket.

AI can also provide automated assistance with this process. It analyzes already closed incident tickets that stretch back over a longer timer period and detects similar tickets with the same kinds of causes. If the frequency of similar closed incident tickets is detected, the AI assumes there is an undetected problem and suggests that the Problem Manager create a problem ticket. If this is accepted, then the algorithm automatically creates a problem ticket and assigns all relevant incident tickets to it. As long as the problem ticket has not yet been resolved, all new similar incident tickets will be automatically assigned to the problem ticket.

Problem management

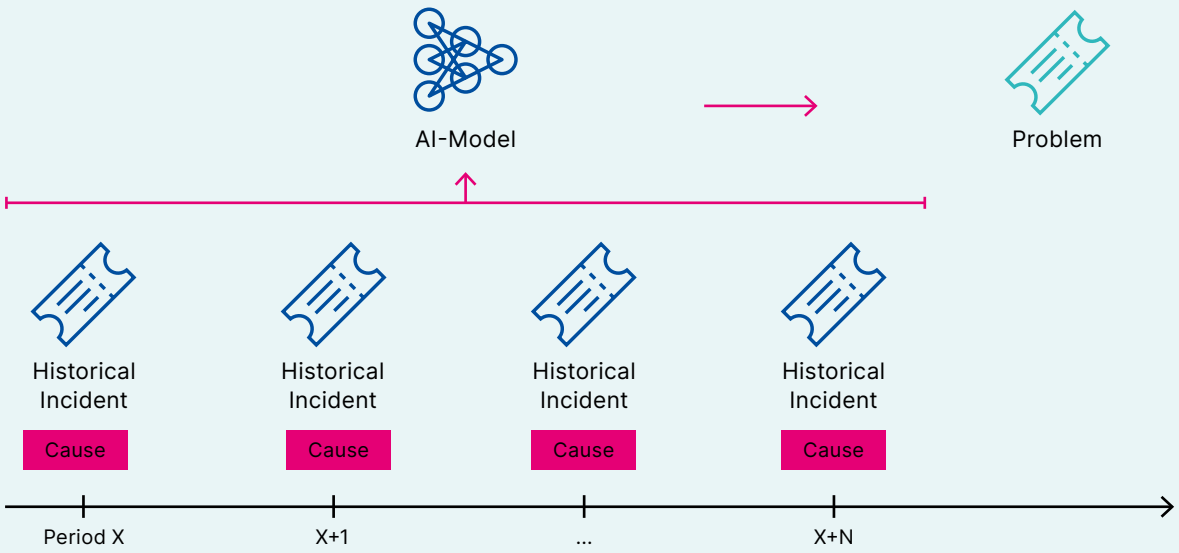


Figure 3: AI-based problem management

As already mentioned for both previously described procedures, a neuronal network is used for this as well. And the confidence value threshold can also be used here to form a framework for fully automated or semi-automated problem ticket creation.

Significant effort can be saved with the help of this AI-based procedure. Extensive manual analysis of historical incident tickets by an expert is no longer necessary. Problems are detected and remedied sooner, leading to a reduction in incidence tickets.

AI-based solution suggestions

Many of the questions received by the Service Desk have already been answered before in the past. And there are current malfunctions that could have been successfully resolved earlier. When the Service Desk employee working on the issue does not remember the cases in the past and there is no suitable solution in the knowledge base, then lengthy research is initiated.

The time spent on this can be drastically reduced with the help of AI. AI detects similar tickets that were successfully deleted in the past and suggests these proven solutions to the Service Desk employee. It therefore actively provides the employee working on the ticket with proven practical knowledge from the past.

As in the previous use cases, a search for similarities on the neuronal network is used.

Solution suggestions

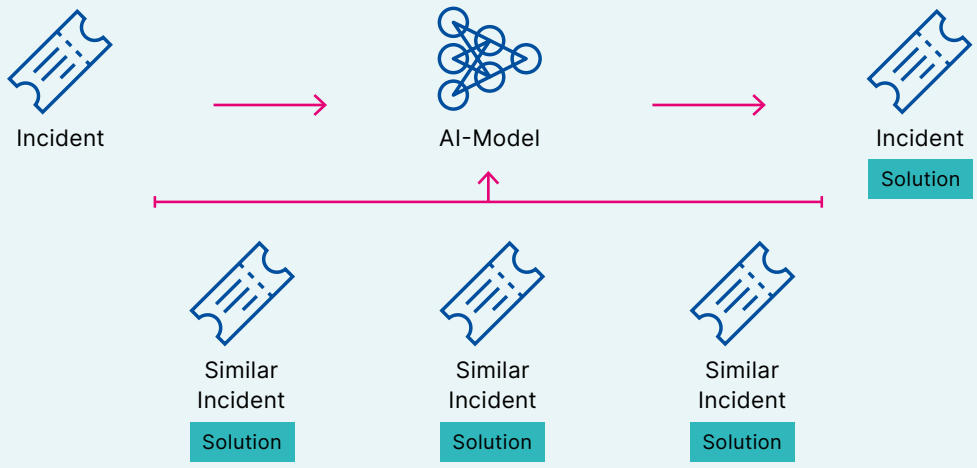


Figure 4: AI-based solution suggestions

The Service Desk not only resolves malfunctions in this manner quickly and specifically, but it also frees itself from a reliance on the expert knowledge of a few individuals by having the expert knowledge of all of our users available through AI. The time needed to complete work at the Service Desk decreases while the user satisfaction increases.

AI-based change-risk analysis

Changes in the IT infrastructure are always associated with a certain risk. Incorrectly calculating or underestimating this risk can result malfunctions with high consequential costs. Change Management is therefore required to determine the potential risk before the change is made. Many influencing factors should be considered here. Examples include:

01 | Scope

How many change requests are to be implemented? How many individual tasks are included in this change? What effort is estimated? How many configuration items (CI) need to be modified?

02 | Dependencies

Which dependencies are present between the affected CIs? Are business critical services affected? Which Service Level Agreements could be at risk? Are there additional changes for the affected CIs?

03 | History

How manually/automatically were similar changes made in the past? How frequently did malfunctions occur? What effect did they have?

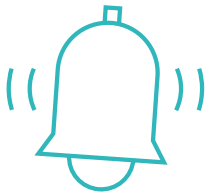
Because this requires very complex combinatorics are required and cloud-based infrastructure continues to change more and more quickly, manual risk assessment or a rules-based process are often pushed to their limits.

With the help of AI, the risk associated with a change can be determined far more quickly and reliably. AI evaluates the changes and the resulting incidents from past and identifies a pattern in the change data. This can be correlated with successful or failed changes. This pattern is then referred to in order to determine the likelihood of success and with it the risk of the new changes.

AI-based early detection of incidents in monitoring

For comprehensive monitoring of the IT infrastructure and the resulting on-going IT and business services, today many different sources of information must be consulted – including infrastructure monitoring software, systems management solutions, application logs, network components, and many more. Each of these sources provides a lot of data which identifies the status changes, also called events, of the infrastructure. During IT operations, a constant stream of events is generated which can only be analyzed efficiently with the aid of an automatically running Event Management. The aim of such Event Management is to detect real warning signals in the data stream early and reliably so that malfunctions in IT operations can be prevented with proactive, corrective measures.

Automated evaluation of these events on the basis of fixed, configured rules reaches its limits when too many influence factors need to be considered, resulting in unmanageably complex rules.



For an AI-based solution, this kind of complexity is not a problem. In the training phase, AI analyzes all past monitoring events with the help of what is known as event correlation analysis and detects patterns that correlate with past malfunctions – or to put it more precisely, that announce these malfunctions.

Early detection

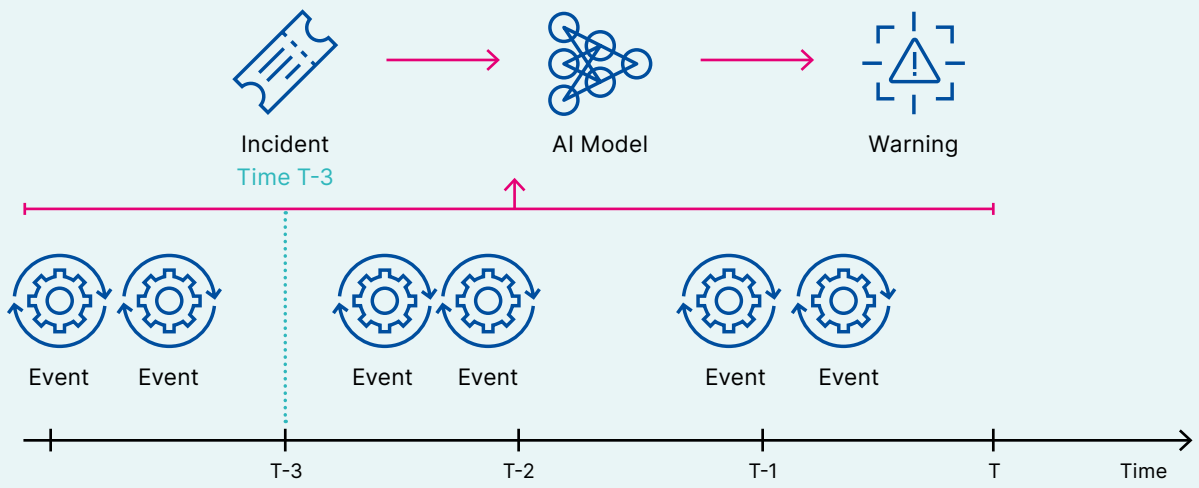


Figure 5: Early detection of incidents

In the operating phase, all newly occurring events are reviewed at regular intervals for this pattern, and a warning message is sent when a pattern is detected. This way, IT operations can preventively analyze and correct even before a critical malfunction occurs.

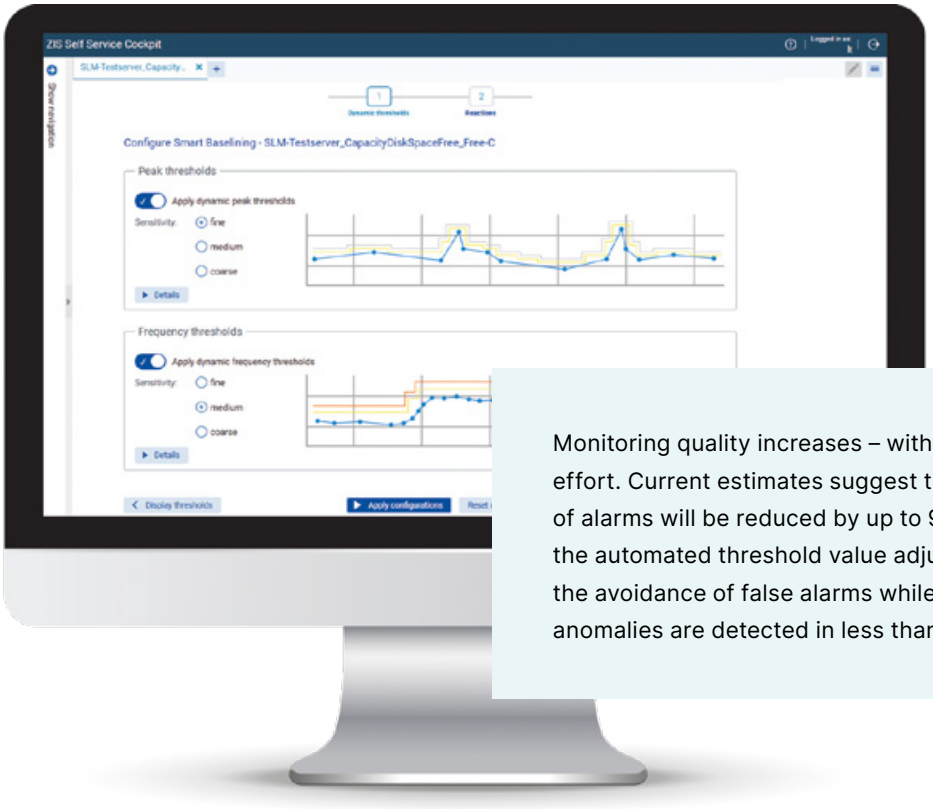
In this manner, malfunctions and the associated recovery times are avoided and the effort for analyses drops. In addition, fewer tickets are sent to the Service Desk.

AI-based anomaly detection in monitoring

In IT monitoring, numerous metrics are continually measured, such as CPU load for a server or the current memory usage for a storage device. If a threshold value is exceeded for a metric, an event is created, which then needs to be processed in Event Management. The following problem arises in determining this threshold value: If the value is set too low, too many events are created, which could result in a false alarm. If the value is set too high, it is possible that important early warning signals are not detected, and IT operations will be faulty.

In dynamic environments, manual determination of an optimal threshold value is hardly possible. AI can assist here. It analyzes the historical processes for the metrics and identifies the pattern that correlates with past incidents. It learns which time periods are normal for the measured metric, and which indicate an anomaly that will lead to an incident. This knowledge is then applied to current operations. Only in the case of an anomaly in the current series of measurements is an event actually created for further processing.

This so-called smart baselining process therefore works as an automated threshold value adjustment. It replaces the strict monitoring threshold value from the past with an upper and lower limit that dynamically adjust to the situation and are automatically updated on a cyclical basis. The software learns how different applications behave under peak loads and which processes are normal. Unnecessary false alarms can be avoided, while “genuine” irregularities can be quickly detected.



Monitoring quality increases – with reduced work effort. Current estimates suggest that the number of alarms will be reduced by up to 90 percent with the automated threshold value adjustment and the avoidance of false alarms while meaningful anomalies are detected in less than a minute.

Figure 6: Smart baselining

Conclusion

The use cases presented in the previous section provide a feel for what is possible today with AI in IT service management. The test phase is over. AI has long since become a constant in ITSM, and the current AI-based ITSM tools lead to a significant increase in the degree of automation, the efficiency, and the process quality in IT service management.

Nevertheless, we are only at the start of this AI-based automation. Additional use cases will be developed with greater speed by the ITSM tool manufacturers and made available to users. Lastly, the IT organization will be relieved of routine tasks – step-by-step – and can increase the focus on the actual value creation: the swift introduction of technology-driven innovations for long-term company success.

About USU

USU is a world leading provider of intelligent software and service solutions for IT service management. With our AI-assisted solutions, companies are able to digitalize and automate all processes for planning, implementation, and operation of IT and business services. Both internal IT organizers as well as service providers active in the external market are able to increase their efficiency, reduce their costs, and increase user and customer satisfaction. With more than 40 years of experience and locations around the world, we are taking you successfully into the future.

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