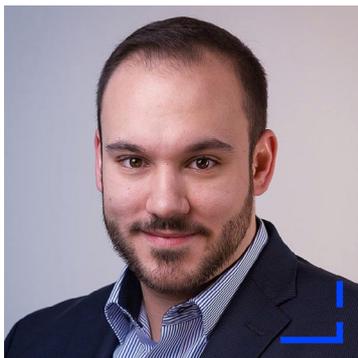




# Scheer PAS – Process Automation and Integration Platform

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# 1. Let's talk change

The ability of a company to develop its own software solutions, and thus to be able to react swiftly and flexibly to diverse challenges is critical for its future success. Software will become more and more important in every industry in the next few years.

The development of a future-proof software engineering strategy represents a major challenge for companies, as the corporate landscape is constantly changing and user requirements are growing exponentially. Application managers must consider combinations of enterprise architectures and platforms (composable enterprise applications) in their business applications in order to be able to sustainably respond to today's uncertain developments. <sup>1</sup>

## Paradigm shift

This shift requires (in addition to the continued use of business-critical standard software such as CRM, Finance, HCM, procurement systems, etc.) the internal development of software to satisfy the growing and changing demands, expectations and preferences of customers.

It is critical for the success of this strategy that newly developed applications are seamlessly integrated into the company's own IT systems and processes. Only in this way can companies create real added value for customers and partners with digitally optimized product offerings and services.

The focus is therefore not only on rapid process automation through a combination of low-code and pro-code application development, but also on intelligent integration, flexible interfacing of third-party systems, secure document transfer or the efficient and sustainable integration of artificial intelligence into the business processes. Only the package as a whole will significantly improve the efficiency of the operative processes and the profitability of the company, and offer a digitally improved user experience to both customers and employees.

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<sup>1</sup> cf. Gartner (2020): Future of applications: Delivering the composable enterprise. Link: <https://www.gartner.com/document/3980861?ref=solrAll&refval=277900664>

## 1.1. Five important facts for the success of a digitization initiative!



A process normally doesn't take place within a single software program. If processes are to be digitized and automated from beginning to end, all the IT systems involved must be taken into consideration and integrated.



Process optimizations have to be performed end-to-end and across multiple systems. Specific minor optimizations in individual systems do not exploit the full efficiency improvement potential in the long term.



If processes or parts of processes are to be automated, the support of new applications and their integration into the existing process and system landscape is always required. At the same time, requirements for data and system integration will always arise at the same time in process automation projects.



Changes in processes and supporting applications must always be quick and easy to implement in order to generate a competitive advantage (speed of change).

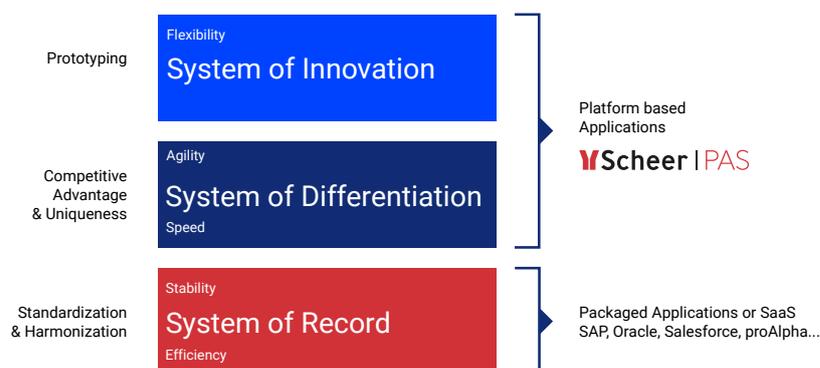


Process digitization and automation almost always involve major or minor programming tasks. In the meantime, simple tasks can be solved using low-code functionalities, while more complex processes still require pro-code tools.

## 1.2. The three levels of IT systems in modern companies

Modern application architectures should always comprise the following three layers:

- 1. Systems of record** – The stable basis: All systems required and established as part of the day-to-day work processes. These include ERP, CRM and HCM systems, as well as online shops or legacy systems. This system category includes stable systems that have been in use for many years and which contain the basic functionalities (e.g. accounting processes and warehouse management) and important data (master and transaction data). They form the basis for the development of new applications. If new market segments are to be developed, e.g. through e-commerce, the transaction data from the online shop must ultimately flow back into the basic systems. At the same time, data from the basic systems, such as product information, must be available for use in the online shop.
- 2. Systems of differentiation** – Highlighting of unique selling points: The use of standard software offers great advantages. Due to their standardization, however, these systems unfortunately offer only limited possibilities for mapping individual and unique processes. The core processes are delivered with the software and can be adapted slightly. It is not possible, however, to fully adapt them to the individual circumstances and unique selling propositions of each company. Competitive advantages that lie in unique processes can thus be lost. The individuality of value-adding core processes must be guaranteed even when using standard software. The “systems of differentiation” thus enable the implementation of unique processes and support individual business models.
- 3. Systems of innovation** – The enablers: New ideas and business models have to be quickly transformed from a prototype into a productive and operative solution. Only then are companies in a position to react flexibly to new challenges and to implement changes in the business model and business processes before it is too late. This ability to bring a company’s own digital innovations quickly to the market will be a key competitive requirement.



Three layers of modern IT architectures

In today's world, it is more important than ever to be able to implement innovations and changes in processes in a self-determined and independent manner. Whether within the company, in contact with the customer, or in collaboration with suppliers and partners – the competitiveness and future viability of the organization will depend on its capacity to quickly bring its own digital innovations to the market. Open architectures, the integration of external services, the speed of adaptation and direct testing in practice are essential for this.

## 1.3. Scheer PAS – The core components of the platform

### 1. Low-code application development

Simple processes and workflows for process digitization and integration of IT systems are modeled in PAS Designer and can then be implemented immediately. If further development becomes necessary due to growing demands, the seamless transfer to a pro-code development environment is guaranteed and efficiently organized. An application code is compiled in Angular from a no-code/low-code application that can be directly processed by a software developer. This ensures that there are no limits to the development of applications. At low-code level, only the modeling of the workflows and the graphical user interfaces is necessary. Data models required are created automatically and do not have to be modeled separately.

### 2. Event-driven architecture (EDA)

All events occurring during the execution of processes can be stored thanks to the flexible and event-driven architecture. It makes no difference here whether these are manually executed processes with corresponding user interfaces or background processes that are required for system and data integration. All important events are thus logged centrally in the platform. Comprehensive analyses can then be carried out on the basis of the stored events. These can include, on the one hand, analyses of the operating processes of the platform (monitoring), and on the other hand specialist analyses through process mining in order to analyze the performance of the running business processes. It also offers the possibility of automatically deriving optimization potentials that in turn can be exploited using artificial intelligence. All the technical prerequisites for hyperautomation scenarios in the platform are thus established.

### 3. Common runtime/tooling

The whole platform uses a common runtime to ensure a sustainable and stable infrastructure. Thus both the automation of modeled workflows in BPMN and integration processes can be executed in the same runtime. The integration processes are also modeled using a modeling tool in xUML Services. Low code is thus also used for the integration component, and a fast and flexible adaptation and structuring of the integration processes is made possible.

## 4. Embedded analytics

Scheer PAS enables the operator and the process managers to carry out comprehensive analyses. The current operating status can be checked and the interfaces managed in API management monitored in the Scheer PAS Portal. Scheer PAS Process Mining offers, on the one hand, ready-made analyses (dashboards) that allow direct insight into critical processes within the platform, and on the other hand users can create individual analyses through "self-service analytics".

## 5. Machine learning and artificial intelligence

In addition to classical analyses, AI services developed in-house can be executed on the platform. Whether companies

- want to make AI services available on a platform
- want to enable a common management of these services
- want to implement AI services in certain applications
- are planning the integration of external AI services

Scheer PAS AI meets all the requirements that are needed today or in the future for the sustainable integration of AI. This ensures that AI projects can not only be quickly developed as prototypes, but can also be robustly implemented in production. Continuous monitoring of these services is also ensured.

## 6. Hybrid cloud

With Scheer PAS, numerous IT systems can be integrated into one platform. It makes no difference here whether the systems are provided in different cloud infrastructures. The platform offers maximum flexibility both for the existing system landscapes and for future projects, such as moving systems to the cloud and the associated cloud-to-cloud integration. The existing API management always enables the secure integration of the different systems.

## 7. Self-service

All components of the platform can for the most part be built and executed by the user (IT department or developer) through the modeling of services. Business processes, user interfaces and integration scenarios are mapped in PAS Designer, the central tool of the platform. Thanks to the flexible deployment architecture, existing DevOps pipelines can be implemented on or connected to the platform. This enables platform operators and system managers to sustainably establish flexible and appropriate processes for the provision of new software components. Workflows that support business processes are modeled using a subset of BPMN (Business Process Modeling Notation).

## 8. Flexible infrastructure

The basic infrastructure of the platform builds on state-of-the-art technologies such as containerization and orchestration of developed docker containers. This method organizes not only the basic components of the platform, but also the services developed on the platform. It is easily possible to update or redesign process components during their productive use without affecting the operation of the software systems. The technical management of the platform offers mechanisms that can be flexibly and easily adapted to situations within the company (DevOps).

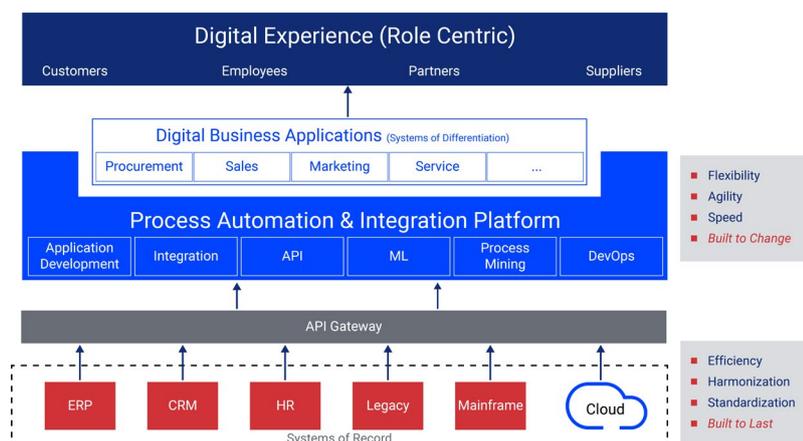
# 2. Scheer PAS – process automation & integration platform

## Process automation | IT integration | Low code & pro code development

Scheer PAS is the process automation & integration platform for flexible, end-to-end support of individual corporate processes. It stands for digitization and automation, irrespective of **how many people, systems or companies are to be connected**.

### Two sides of the same coin

The end-to-end digitization of processes always consists of applications and integration. The focus is therefore not only on fast process automation through a combination of low-code and pro-code application development. It is at the same time a matter of intelligent integration, flexible connection of external systems, secure document transmission or effective integration of AI for decision support.



Scheer PAS digitization framework



*This whole package will significantly improve the efficiency of the operative processes and the profitability of the company, and offer a digitally improved user experience to both customers and employees.*

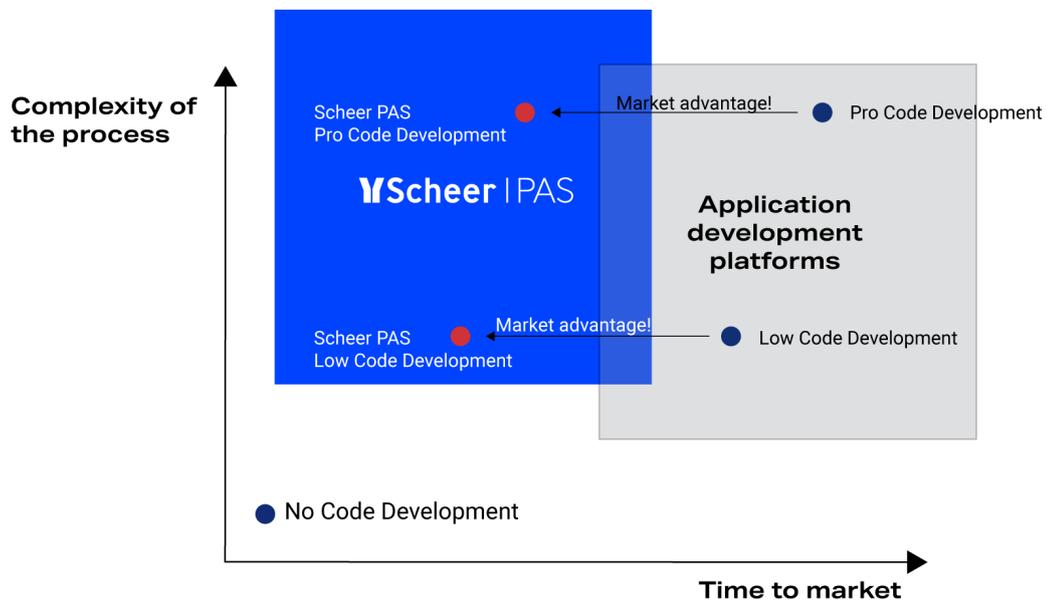
Dr. Wolfram Jost, Managing Director Scheer PAS

## Innovative, fast, comprehensive and efficient – low-code/pro-code application development

Fast and flexible adaptation of corporate processes to new situations is critical for the success and future viability of companies. Whether it's improving the customer experience, making changes to the business model or global crises that force companies to act, Scheer PAS enables immediate change and innovation.

Here Scheer PA provides not only a low-code/pro-code development environment, but also supports the whole DevOps pipeline, including implementation, automation and monitoring.

Finished applications and complete processes are continuously monitored, analyzed and optimized through process mining. The integration of AI services enables efficiency increases through automation and decision support (Decision Intelligence). Mobile working becomes the norm, whether in production, in the field, or in the home office. All processes can be digitized and automated end-to-end in one platform.



Advantages of the Scheer PAS "Time to market" platform

## Agile, flexible, stable, and fit for the future – IT integration and modernization!

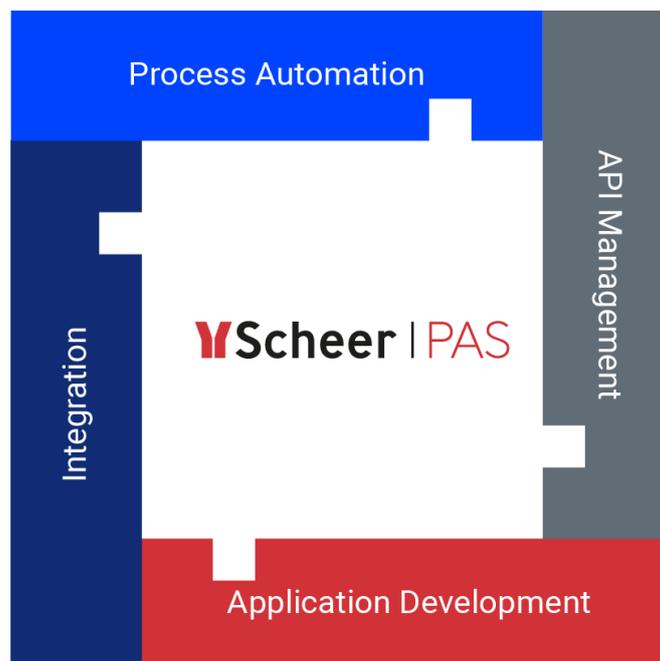
Intelligent integration is the basis for digital transformation. Modern business models require flexible and transparent IT landscapes in which changes can be implemented quickly. Digitization only works if new systems and processes can be integrated easily and intelligently into the existing system landscape, because if the IT systems are not interacting optimally, the processes and efficiency suffer. And if companies cannot react quickly and flexibly to the changing challenges, their competitiveness suffers.

Scheer PAS Integration offers all the possibilities for implementing integration projects, from simple to complex. This enables not only the process-specific provision of data, but also a sustainable and efficient solution to complex integration problems, such as the linking of ERP systems and online shops. Thanks to the seamless linking of process automation and integration, digitization projects can be implemented end-to-end with one platform.

## Scalable, secure, convenient – API management!

APIs make processes more efficient and optimize the use of existing data, whatever their source. Scheer PAS API Management helps companies to keep all interfaces under control and to optimize their use. Scheer PAS combines IT integration and API management on one platform. New and existing interfaces are automatically transferred to the API management and can be managed and published in an API catalog. The developer portal provides secure and easy access for developers and customers. The data within a company is made available accordingly. APIs can be monetized by means of API management. For example: The call up of an API can be priced at EUR 0.30.

Scheer PAS combines two existing system categories on the market and offers all the features for end-to-end process digitization and automation. Low-code/pro-code development platforms and integration platforms are merged for an optimized user and developer experience.



Components of Scheer PAS

## 2.1. Application development

The ability of a company to develop its own software solutions, and thus to be able to react swiftly and flexibly to diverse challenges is critical for its future success.

Gartner prepares CIOs for uncertain times. The market research and consulting firm recommends approaching a moving objective by way of many small, easily correctable steps. In a related study, IDC assumes that, over the next three to five years, virtually all companies – independent of their industry – will develop toward becoming a “digital innovation factory”. One thing is clear: Speed is key.

The fastest shall receive the spoils – provided they have a structured and, at the same time, flexible strategy to set up their digital-native company.

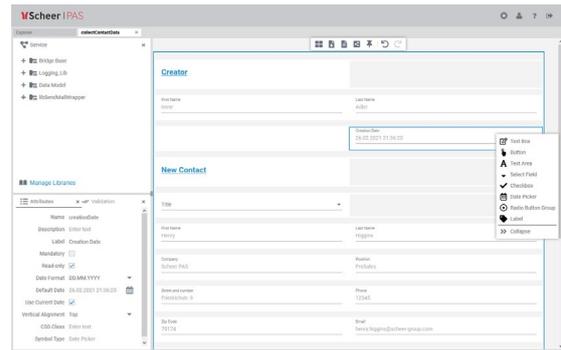
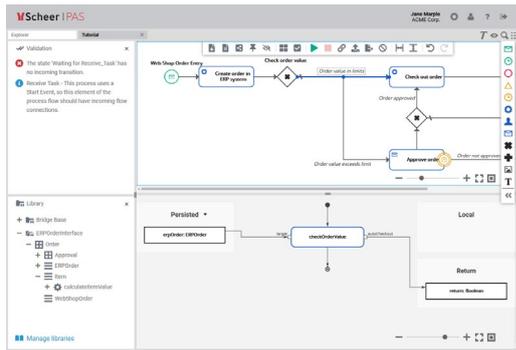
Whether within the company, in the customer contacts, or in the collaboration with suppliers and partners – future viability will depend on whether and how quickly companies can bring their own digital innovations to the market. But what is required in order to independently implement innovations and changes in the processes? Classic systems of record such as ERP systems are frequently incapable of making necessary adjustments or further developments, or cannot do so with the necessary speed or flexibility.

### More high speed thanks to low code and pro code - digitize processes, quickly and simply

Development platforms normally support either pro code or low code – Scheer PAS combines both approaches. This means that experienced expert users, “citizen developers”, can use PAS Designer to develop simple processes via BPMN and, for example, configure the design of the user interface using drag-and-drop. At the same time, the compiling of the low-code applications in Angular code ensures that more complex projects can be developed directly in the protected pro code area.

A special feature here is the seamless transition from model-based low code to code-based pro code development. This means that processes can be continuously further developed and are available centrally on a platform. The developed applications can then be seamlessly integrated into the company’s own IT systems and processes via the integration component. Whether it’s a matter of defining workflows using BPMN, designing the user interfaces or connecting different systems and data sources, Scheer PAS provides all the tools and enables companies to deliver real added-value to their customers and partners with digitally optimized product offerings and services.

And the best of all: With the process modeling, a large proportion of the technical implementation has already been done, and the wishes of the specialist departments can be satisfied according to their requirements.



Scheer PAS Designer

## Excursion: What exactly is no code/low code/pro code?

### No code:

Business users are enabled to create application software without any programming know-how thanks to the graphical user interfaces, “drag-and-drop” and simple configuration.

### Low code:

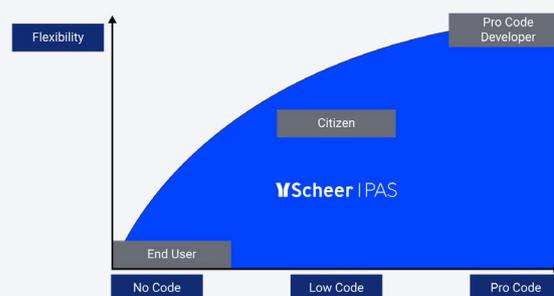
A low-code development is typically programmed in an integrated development environment just like conventional programming by hand. Unlike conventional programming environments, however, low-code development platforms frequently use preprogrammed standard software modules instead of individual program code. Intelligent metadata is then used to control these in such a way that a program behavior is created that is almost identical to that of a handwritten application. The development of an application usually takes place in different stages.

### For this you require:

- A data model in which the application data is stored.
- External data: Resources from third-party providers such as REST-APIs can be integrated into your application.
- An application logic in which the workflows for different scenarios of the application are created, equivalent to writing methods in Java or C#.
- A user interface for the front-end of the application for the end user that represents the graphical user interface. These interfaces can be created across platforms.

### Pro code:

Classic code-based software development with all the possibilities, provided that developer know-how is available.



What does the Scheer PAS platform cover?

## 2.2. Process automation using artificial intelligence – more time for value creation

A crucial factor for increasing the efficiency of processes, apart from digitization, is automation. There are routines everywhere that are often repeated and (almost) always run in the same way. These are the processes that are important, but mostly monotonous and therefore prone to error, that cost time and that no one likes to do. But it is precisely these processes that offer enormous automation potential!

With Scheer PAS, these routine tasks can be automated after or at the same time as the digitization and on the same platform. Extensive integration functionalities and an AI component, for example, are available for this purpose. Whether for routines that have to be executed over and over again by a classically developed program, or for more complex decision aids using artificial intelligence, Scheer PAS enables every form of au-

tomation. Integration makes it possible to have the right data available in the right system at any time in order to maximize the degree of automation or to automate processes completely. This is done, for example, by simultaneously executing queries in different systems and then aggregating the data for further processing. As a result, more complex decision-making processes using Decision Intelligence and the provision of the required data can be automated directly in one step. Complex decisions based predominantly on the combination of different information from different data sources are thus automated directly in the process. Work reductions of over 80% are not uncommon and relieve highly qualified employees from time-consuming, cost-intensive and error-prone routine activities.

### Core functions:



Integration of all modern mechanisms of process automation, such as artificial intelligence or software robots (robotic process automation). Implementation of any kind of hyperautomation scenario



Deployment services of automation solutions can be implemented directly in the platform through artificial intelligence. All automation services used can thus be monitored accordingly and continuously improved (AI Operations).



General automation of workflows (business process automation) through the Scheer PAS process execution engine.

## 2.3. Application/hybrid integration – the basis for the digital transformation

Thanks to the modular microservice architecture, the whole architecture can be divided into individual packages and the individual process steps thus processed separately. Software is thus modularized and the scaling of individual subsections significantly simplified.

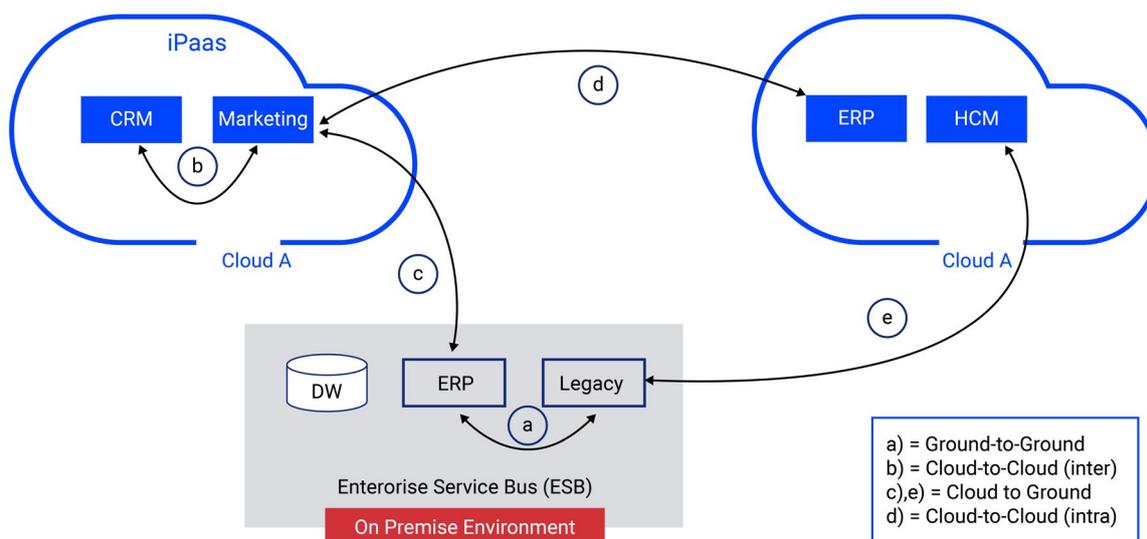
The first step is to create a process-based model in which the flow and function of the application is defined. From this, Scheer PAS generates a functionally equivalent xUML state machine with persistent states. This is a very powerful function since the generated service can be packaged and deployed immediately. In the basic version, this service writes log messages for each status change. Nevertheless, action implementation models can be added one by one. In the case

of simple synchronous integration services, this step can be skipped and synchronous call logic can be implemented directly.

The keyword is "model design". We believe that the power of this concept cannot be over-emphasized. In concrete terms this means that a fully functional process can be started from the very first minute. The model is executed without the need to generate code.

Scheer PAS uses this approach and goes even further: Individual microservices are not executed as part of a monolithic approach but rather, in runtime and even at operating system level, they are handled and executed as independent processes – all managed centrally on our platform.

### Hybrid integration – keeping IT under control:



Complex integration architecture with Scheer PAS

Integration takes place where the systems are. No matter whether the system landscape is operated in the cloud, in the company's own data center or in both, with the hybrid integration approach Scheer PAS offers maximum flexibility to ensure a sustainable supply of the right data to the IT system landscape and the business processes.

## 2.4. API management – all the interfaces under control

APIs make processes more efficient, and they optimize the use of existing data, wherever the data is stored. An API management solution helps companies to maintain control of all interfaces and to optimize their use.

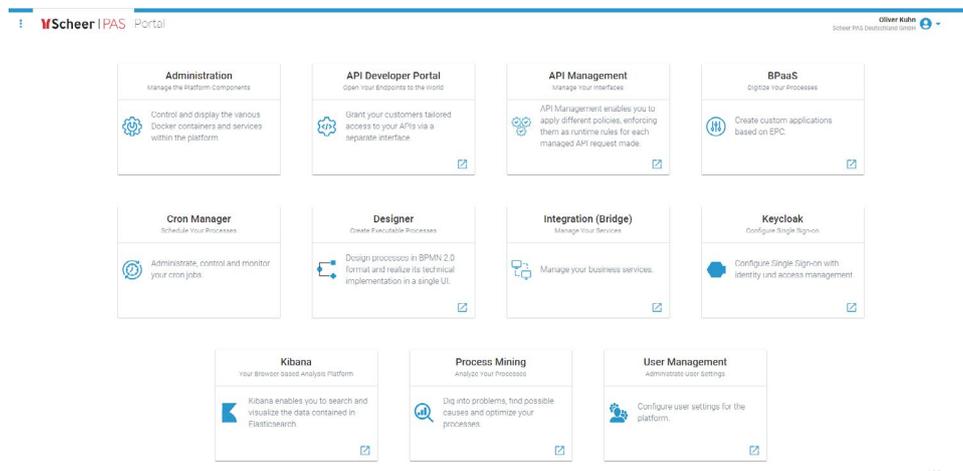
Scheer PAS combines IT integration and API management on one platform. New and existing interfaces are automatically transferred to the API management and can be managed and published in an API catalog. The developer portal provides secure and easy access for developers and customers.

APIs or program interfaces are program components that make an application available to other systems for connection purposes. This

also includes detailed documentation of the interface functions and their parameters. But why are APIs and their professional management so important? Many IT systems may also mean many APIs. An API management system is important to keep control of their use, access and publication. It means security for companies. Accesses and the use of the APIs are protected, different versions of an API can be saved and organized centrally, public and private interfaces can be made available via one URL, and accesses can be controlled centrally. APIs thus have optimum security, and companies are protected against criminal attacks by deciding themselves who has access to their data!

## 2.5. Administration – keep the overview

All the components of the platform are centrally accessible in the Scheer PAS Portal. It supports the platform administrator in managing and monitoring all important information at service level. The individual services can thus be parameterized and also started and monitored centrally. Critical system states can be localized directly and problems contained, since continuous availability has to be guaranteed, particularly for critical business processes.



Depending on their rights, users can access certain components within the portal. The Scheer PAS Administration offers direct access to all logs of the platform and enables holistic administration of the services.

The screenshot shows the 'Administration' page of the Scheer PAS portal. The page title is 'Scheer PAS Administration' and the user 'Oliver Kuhn' is logged in. The main content is a table listing various services and their operational status.

Service Name	Technology	Status	Last Update	Version	Actions
helloworld-task-service2-property-archive/appendix	Java	stopped	Not available	0.0.1	Start, Stop, Refresh, Settings, Help
ldap-auth-service	pas-service	running	10.03.2021, 06:26:14	rc	Start, Stop, Refresh, Settings, Help
mailer-service	pas-service	running	10.03.2021, 06:26:13	rc	Start, Stop, Refresh, Settings, Help
management-console	pas-app	running	10.03.2021, 06:25:42	rc	Start, Stop, Refresh, Settings, Help
messaging-service	pas-service	running	10.03.2021, 06:26:13	rc	Start, Stop, Refresh, Settings, Help
model-editor	pas-app	running	10.03.2021, 06:25:41	latest	Start, Stop, Refresh, Settings, Help
model-editor-service	pas-service	running	10.03.2021, 06:26:11	latest	Start, Stop, Refresh, Settings, Help
model-execution-service	pas-service	running	10.03.2021, 06:26:13	rc	Start, Stop, Refresh, Settings, Help
NodeTest	NodeJs	stopped	Not available	1.0.0	Start, Stop, Refresh, Settings, Help
NodeTest2	NodeJs	stopped	Not available	1.0.0	Start, Stop, Refresh, Settings, Help
NodeTest3	NodeJs	stopped	Not available	1.0.0	Start, Stop, Refresh, Settings, Help
pas-designer	pas-app	running	10.03.2021, 06:26:14	rc	Start, Stop, Refresh, Settings, Help
pas-designer-service	pas-service	running	10.03.2021, 06:26:13	rc	Start, Stop, Refresh, Settings, Help
pcrersistence-service	pas-service	running	10.03.2021, 06:26:14	rc	Start, Stop, Refresh, Settings, Help
ProcessTraceAPI	xUML	stopped	Not available	1.0.0	Start, Stop, Refresh, Settings, Help
PSLoadMySQLZRT	xUML	stopped	Not available	1.0.0	Start, Stop, Refresh, Settings, Help
PSLoadMySQLRT	xUML	stopped	Not available	1.0.0	Start, Stop, Refresh, Settings, Help
reporting-service	pas-service	running	10.03.2021, 06:26:13	rc	Start, Stop, Refresh, Settings, Help

Scheer PAS Administration

### 3. Creating a composable enterprise with Scheer PAS

Scheer PAS is the only provider on the market to offer functionalities for application development, process automation and IT integration on one platform. We focus on the functionalities that from our experience we know guarantee our customers maximum flexibility for the future on the one hand, and direct end-to-end process digitization, automation and integration of all IT systems on the other.

**Let's talk.  
Together we'll find the best  
solution for your company.**

**Let's talk change!**

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## About us – Scheer PAS

Scheer PAS is an innovative software company assisting companies and organizations with implementing changes in processes and applications as quickly and smoothly as possible as part of their digitization efforts.

Let's talk change!