Sustainable IT for Energy Providers

SAP S/4HANA Guidelines

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Foreword

Increasing IT costs for energy providers and a lack of resources to invest in innovative projects is a situation that many companies in this sector are all too familiar with. Regulatory requirements demand significant resources in a market that finds itself in a state of flux. Reducing margins are increasingly restricting the ability of many companies to implement expensive IT solutions. In this situation, the news that SAP can only guarantee standard maintenance for R/3 and their billing system IS-U until 2025 is yet another challenge.

The working group for energy providers within the German-speaking SAP user group (DSAG) ensures that the concerns of this sector are addressed to SAP. In collaboration with other DSAG working groups, they maintain a constructive and critical dialog with the producer of one of the most widely implemented ERP and billing solutions for energy providers. Their mission is to overcome future challenges as equal partners.

The current instability in the market provides an opportunity to question previous and current strategies. Aligning highly dynamic development processes in the software market with a company's own business focus is a significant challenge when making long-term strategic decisions. A lack of information, combined with wrong information can make investment decisions risky and compromises active change management. Actively involving employees in the transformation process at an early stage is the only certain means of harnessing the potential of this transformation process in the long term.

This guideline attempts to clearly present the facts required to make decisions and to deal with any open questions and topics that are currently being discussed in the market. This will help energy companies find a solution and will also benefit future dialog with SAP.

The document is the result of collaboration between the authors, who have shared their experiences from their own projects, a great deal of discussions with colleagues, and some intensive dialog with SAP employees. It will not be possible to provide a universal recommendation on how to perform the transformation. However, we hope we can provide you with some valuable suggestions and support on your journey towards implementing a new IT architecture.

If you have any feedback on this document, or any relevant experiences you would like to share, the authors and DSAG energy providers working group would be happy to hear from you. Please get in touch with us!

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1. Introduction

In recent years, the energy sector has been subject to a permanent shift in focus. From renewable energy generation to regulatory requirements, the current demands and business processes are virtually unrecognizable from those that were relevant when many companies first implemented SAP R/3 and IS-U. The economic drivers behind these demands are not only increasing cost pressures in a competitive market and a tougher battle to gain customer loyalty, but also the shift in demographics resulting in a shortage of qualified staff in energy companies. Companies from other industries have identified the energy market as a new opportunity and have come in with lower expected returns and different technological approaches. By contrast, established energy providers are seeking to enhance their product portfolio by adding non-energy-related products and services. Repositioning business strategies also requires the IT architecture to be realigned.

SAP has also triggered a technological change within the IT sector by developing SAP S/4HANA, the successor to SAP R/3. Big Data, In-Memory-Computing, Cloud, and the increasing use of processes based on artificial intelligence are all technologies whose potential should be unlocked in the future. Previous technologies are no longer sufficient as a basis for this.

SAP's announcement that they will only provide standard maintenance for their existing SAP R/3 solution until 2015 has prompted many companies to consider restructuring their IT architecture. However, there is a great deal of uncertainty about the right way to do this. The main discussion in the sector focuses on different theories regarding the future positioning of SAP products. These can be divided into three problem areas: Cost, product portfolio, and innovation. Figure 1 shows some of these theories.

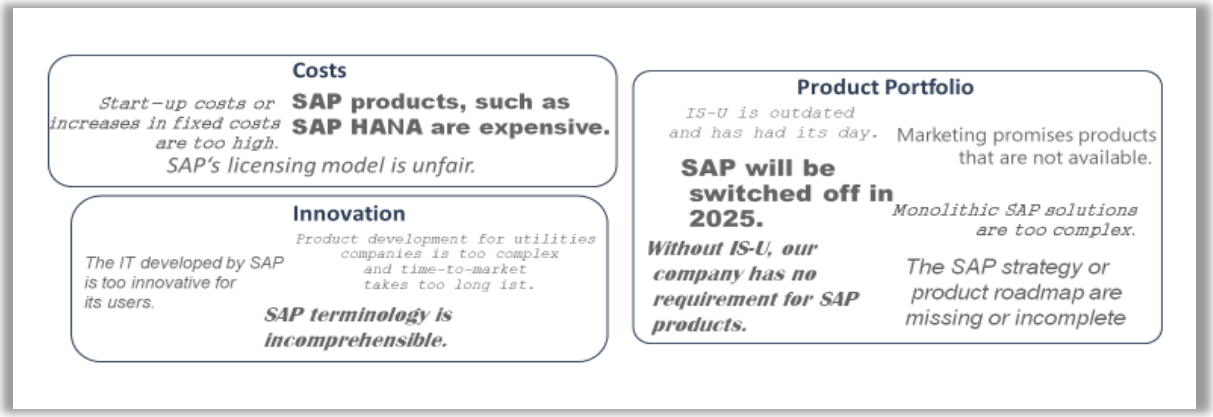


Figure 1: Main Theories Regarding SAP IT Infrastructure

This guideline examines these theories in greater detail. Some of them can be dismissed fairly quickly. Others require a more differentiated and company-specific analysis.

The starting point for making a company-specific decision must involve the management of an energy provider defining their future position, both in the marketplace and with their customers. Two opposing strategic positions exist. On the one hand, energy providers could position themselves as a partner who provides extended basic services, offer a broad portfolio in an environment of networked suppliers, and become a significant brand in the market. On the other hand, they could place their main focus on their current core business and use low unit costs to leverage price leadership and position themselves using an established brand if necessary. There are of course a range of variations between these two extremes. However, in each case, strategic positioning will significantly define what processes and IT architecture are required. Deciding on the business strategy to be adopted is therefore essential in ensuring that the transformation of processes and the IT infrastructure is successful.

In both cases, in terms of IT architecture, the issue of a successor to IS-U, but also the ERP architecture in general must be addressed. A replacement for SAP R/3 would need to be in place by 2025 at the latest. The issue of process-related dependencies when providing products to customers is far greater than simply deciding whether existing IS-U functions can be used. Questions regarding changes in licensing are also no longer restricted to the existing individual SAP components. The economic viability of successive solutions can therefore only be evaluated from a holistic point of view.

Following the strategy of acting as a partner providing extended basic services, companies should take a holistic approach that identifies dependencies and thus supports a macroeconomic decision.

This guideline aims to address the following:

1. The solutions presented should be suitably differentiated. They should provide some insights into the different ways of structuring the target architecture for processes and IT and should also give you an idea of the resulting transformation steps required. These are explained using two reference architectures.
2. Drawing from experiences from the initial transformation projects in the industry, and other sources of information, we will establish a basis for a sound decision-making process.
3. By asking relevant key questions regarding IT transformation at the end of each chapter, we aim to encourage and support discussions within your company.

This document is primarily intended for top management and members of the executive board. They are responsible for making the appropriate decisions regarding the transformation and defining a consistent and sustainable change process. This docu-

ment does not dictate how your company is to conduct the transformation. It is designed to provide food for thought on how your company can find the most suitable solution and help you identify risks and opportunities at an early stage.

It examines the future direction of the IT landscape along with the increased potential associated with realigning the SAP portfolio to modernize business processes and take the first steps towards creating an open architecture.

Chapter 2 examines the current and future requirements associated with process support in more detail.

Chapter 3 then presents the current and future options for an SAP architecture. Which functions will be available and when? Which operating models can be used? In this context, selecting an IT manufacturer is a major strategic decision. Both content-related restrictions resulting from the choices made here, future opportunities and the need to establish a long-term partnership based on mutual trust even in the event of problems, are vital issues for any company. Due to the complexity and the uncertainty around future developments, the choice of a suitable partner also requires a certain amount of trust. Providing an affordable, stable and innovative technology that will significantly influence the success of energy providers of the future requires an economically powerful IT provider with a solid international and cross-industry refinancing background. Having in-house research and a sufficient number of employees as well as an established ecosystem of professional consultancy firms can provide the necessary security for the future.

In addition to managing available technologies, energy providers are faced with the challenge of mastering the transformation process and training their employees to get the best use out of the new systems. Chapter 4 looks at the possible transformation steps for two reference IT architectures. The DSAG's request to SAP is to provide the companies with better support to reduce any uncertainties.

The concluding summary includes an outlook of other possible support options, from both SAP and through collaboration with the DSAG. The broad range of topics in which the DSAG is involved enables them to share both national and international experiences from both this and other industries. The DSAG is also part of a network of experts that use a wide variety of technologies and is focused on both creating these synergies and addressing companies' interests to SAP.

2. Requirements of the Energy Providers

The liberalization of the energy market has fundamentally changed the regional and municipal utilities companies sector. Customers now have the right to decide who provides their gas and electricity. New technological advances have also significantly changed the way in which private and commercial customers obtain and exchange information. These changes present huge challenges for regional and municipal utilities companies.

The emergence of Amazon in the retail sector indicates a more fundamental change that will affect all sectors. Previously, existing business models, products, and services were always developed further in phases and were sometimes partly replaced by innovative new developments. These evolutionary changes are now being compromised by disruptive developments that destroy entire business models and established companies. New players (also known as disruptors) with new business models and services are entering existing markets and transforming them increasingly quickly.

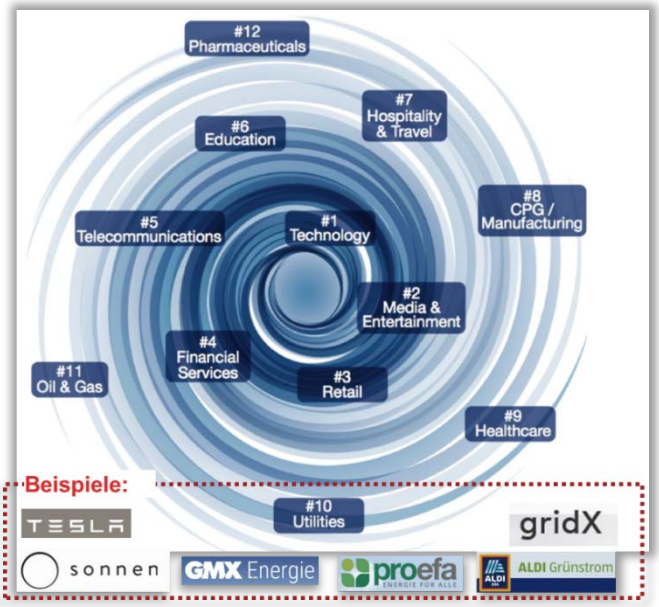


Figure 2: Threats from Disruption up to 2020 (See also [7]

Examples of such activity in the energy sector are the entry of GMX as an Internet company, whose main business was previously the provision of e-mail related services, or ALDI who were previously simply a retail company. These companies now offer gas and electricity products that were previously only available from regional and municipal utilities companies. This is an ideal springboard for these competitors to start offering energy-related services. Distributors also must compete with new market players such as GridX or Tesla. Figure 2 shows the ten industries that will be most affected by disruptors. Energy providers are number 10 on the list.

This means that, today more than ever, utilities companies need to develop and market new business models, and market-compliant, economical products and services. In the current market, expanding a company's portfolio to include energy-related and/or regional services as shown in Figure 3 on the basis of established gas and electricity products and services is a logical next step. Smart homes, charging infrastructures, Internet and communication, energy consulting, and solar panels are just a few examples of new business areas that utilities companies are exploring.

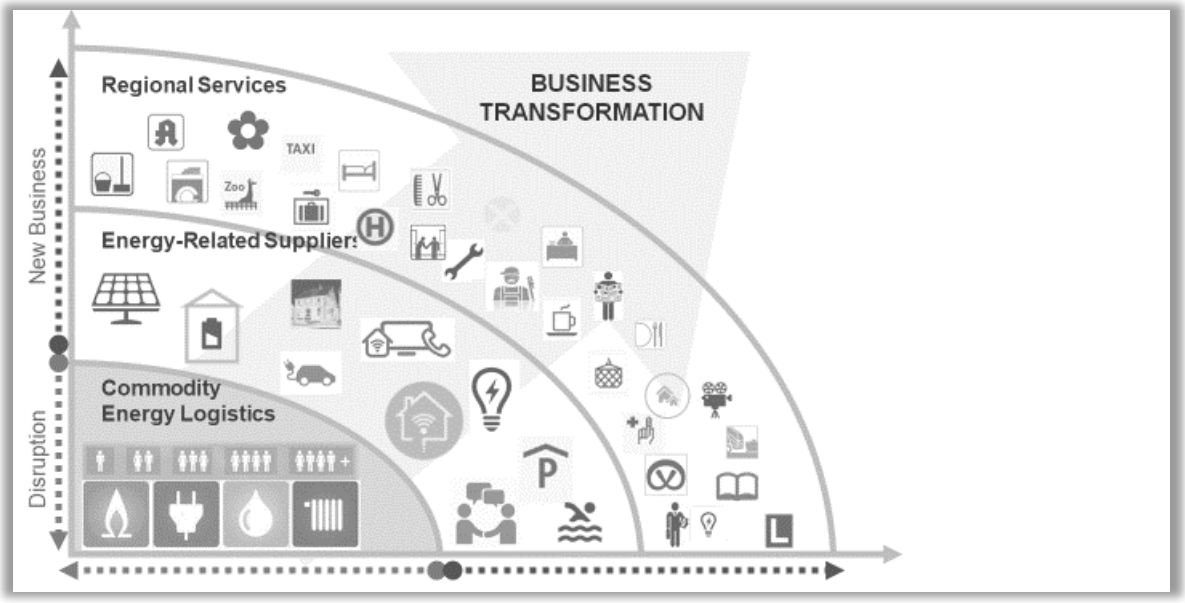


Figure 3: Business Development for Energy Providers

Utilities companies in particular enjoy higher than average customer confidence. Expanding the product portfolio to include additional regional services can further strengthen this customer relationship if the new products are sufficiently stable and cost-effective. Utilities companies can use customer cards and bonus programs, to become regional platform providers and support local businesses on site with digitalization. The customer should regard the energy provider as the central “solver” of day to day problems.

However, this means that the resulting service must be provided by both the utilities company, and by third parties who should be involved directly. Lower margins from commodity and non-commodity products require value drivers and risk factors to be monitored continuously, so that any missing contribution margins can be identified in time and the appropriate action taken. It is important that all communication with the customer, including that related to third-party services, continues to be handled centrally by the utilities company (Figure 4).

To be able to offer the customer a comprehensive worry-free package from ordering and delivery through to warranty handling for products and services, continuous central monitoring and controlling is required for both the entire process and the individual steps. This is the only way to ensure that new products and services are sustainable to improve customers' perception of the utilities company and to stop disruptors from intervening between the energy provider and customer.

To master this necessary transformation of the utilities companies, an efficient and economical IT architecture is a fundamental requirement. Standardization, business process automation, simple and cost-effective compliance with legal requirements,

and low-cost operating models are fundamental IT requirements in the current market. Cooperation and the use of Cloud services for functions that do not represent a competitive differentiator are ways of counteracting this pressure by using economies of scale. Such solutions need to be an efficient part of the overall architecture to avoid rising costs and a reduced ability to act.

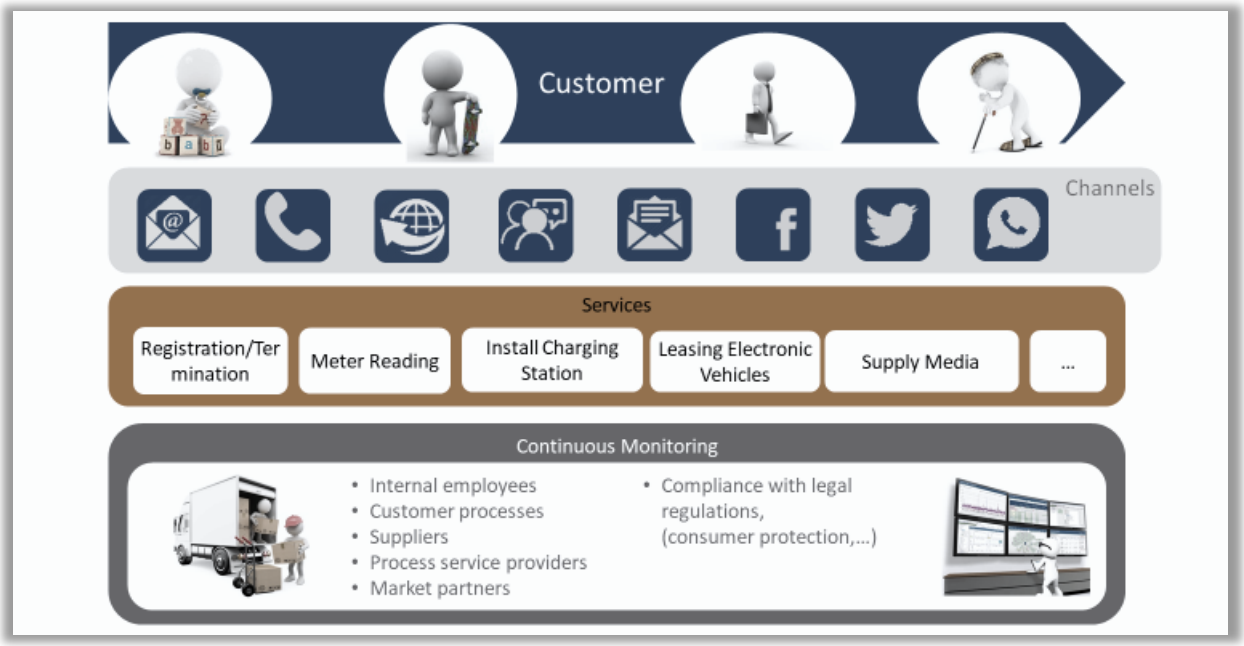


Figure 4: Structure of a Customer Business That Includes Third-Party Products

Additional issues associated with transforming existing business models require various solutions on the market to be “tested”. IT must make such an approach possible without compromising the company’s profitability and stability. Scalable solutions and a significant number of open interfaces are an essential part of implementing an innovative business.

Using Cloud services that can be consumed on a “pay per use” basis from the Internet at the touch of a button, is one way of being able to respond quickly. It is crucial to integrate these services in the hybrid structures of the IT operating model so that normal operations can quickly be resumed even in the event of a malfunction without compromising data consistency. This requires both a central overview of the implemented solutions and of the structure and locations where data is processed. Enhanced data protection requirements and security requirements for critical infrastructures, combined with an increasing involvement of IT in all processes up to the integration of sensor technology are additional reasons to ensure sustainable transparency in the company in these areas.

The inclusion of “white-label services” (processes that are purchased “End2End” and are only branded in the portal) is part of the challenge to be mastered by a utilities company’s IT structure in new markets.

Available IT systems and services to cover a company's central IT requirements, the respective company business objectives, and the applicable legal framework mean that the IT infrastructure of each company will be very different in key areas. However, from a technical perspective, the modular structuring of the IT infrastructure should be retained in every implementation to reduce complexity. An example of this modular structuring is the functional reference architecture that was designed by the cross-association initiative [1]. In the following, we will use a more extensive model to reflect the overall effects of these changes (Figure 5).

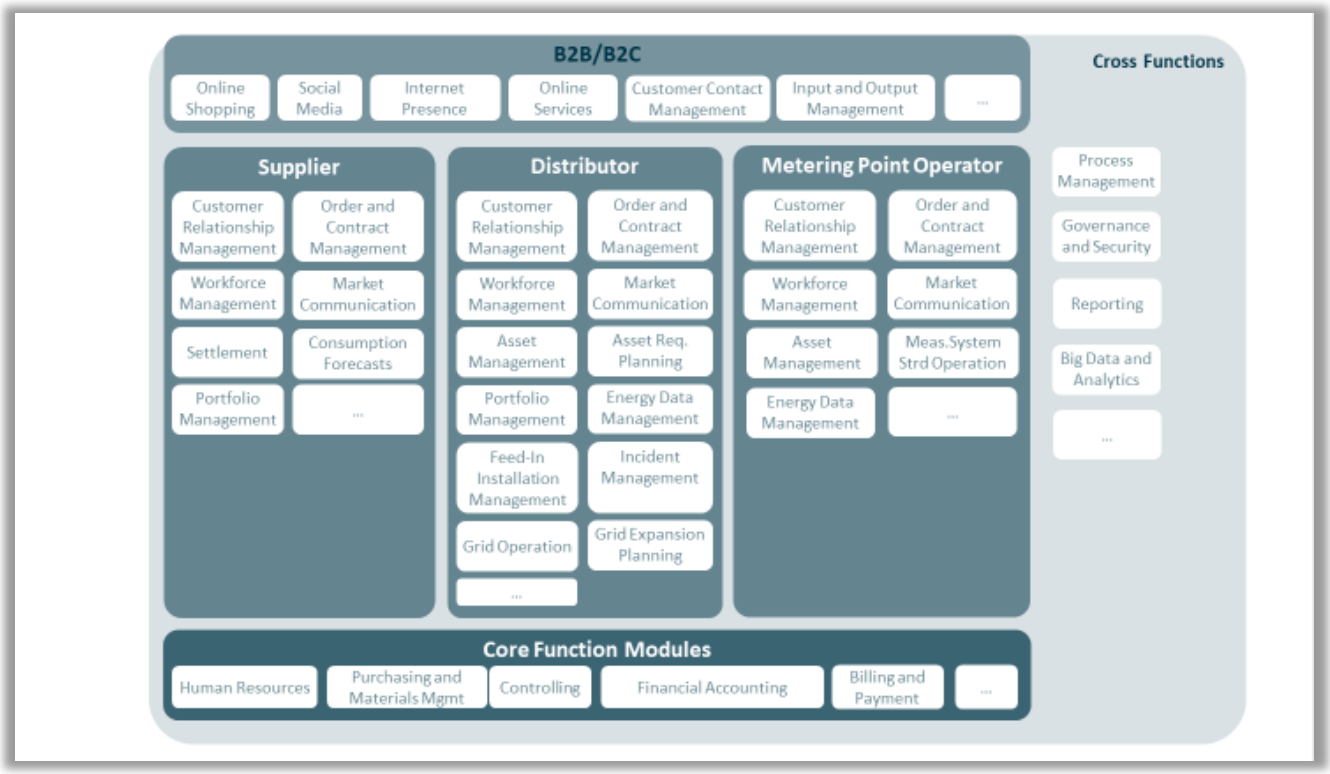


Figure 5: Functional IT Architecture for Energy Providers [1]

Without claiming to be complete, the example uses the lifecycle of a non-commodity product to show the importance of interaction between the individual components.

An energy provider wants to develop regional services as a new business area and wants to start selling electricity storage for private homes along with their established range of electricity products. The product idea is initially outlined. Following management approval, the product idea is defined in more detail so that possible service providers can be requested for sales, delivery, installation, and maintenance and repair, and general terms, such as prices, delivery times, maintenance contracts, questions about product liability, billing and invoicing, and incident processing can be clarified. Once the service providers have been selected and the respective master agreements have been signed, the product "electricity storage" can be defined and priced. At this stage, details such as product installation and billing are clarified.

At the same time, initial marketing activities can be triggered to market the product. During the next stage, the product is published in the product catalog and upstream processes such as order processes or incident processes are implemented. At the end of this stage, customers can order the electricity storage units. Once an order has been placed, it is processed by the service provider that was chosen to sell the electricity storage units. After clarifying delivery times, the service provider responsible for installing the unit needs to be involved in parallel to arrange an appointment with the customer. Ideally, the service provider should be on-site when the delivery is made so that the unit can be installed straight away. This ensures that only one on-site appointment with the customer is required. The energy provider is the central contact for the customer. Once the unit has been connected, it can be deployed. The energy provider should also manage any communication about maintenance and organize appointments for the maintenance service provider to visit the customer.

In future, the electricity storage units could be connected electronically to the energy provider's Asset Management system. This would enable predictive maintenance solutions to predict outages or other problems and would allow maintenance to be proactive rather than reactive. In this case, the maintenance service provider would be at the customer's site before the customer was even aware of a problem, such as an outage. Customers can use the online services to view previous bills and battery storage data. Figure 6 shows an overview of the entire process.

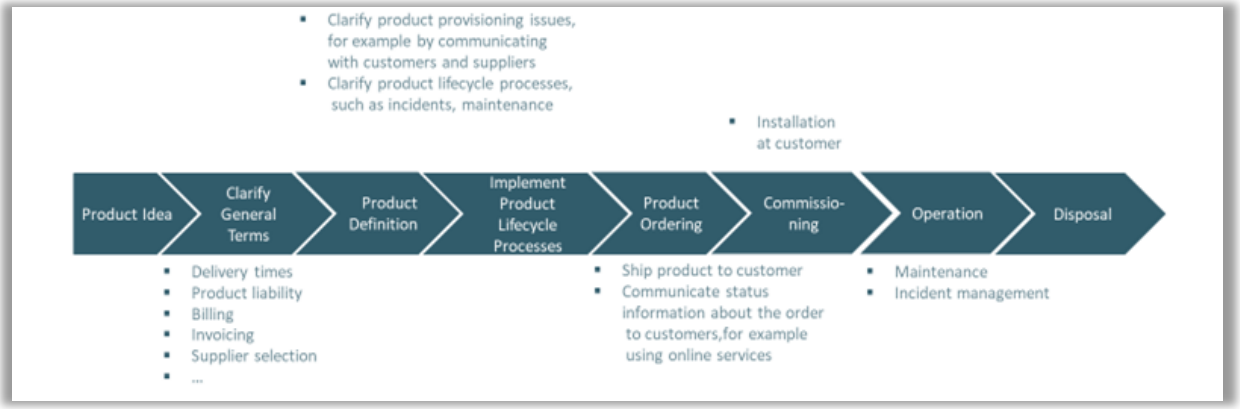


Figure 6: Process for Developing New Products

This type of approach requires an IT solution in which customer communication, service provider management, order processing, maintenance solutions, and intelligent analytical functions are integrated. Generally speaking, this type of digitalization would need to be aligned across the company to ensure efficiency and quality for all parties. This type of industrial mindset is essential to enable an employee to see their tasks in the context of the bigger picture and to perform them with the necessary level of quality.

This will only benefit customers if the integration process is based on a central platform with open interfaces for connecting different solution providers. Currently, this is only the case for utilities companies who intelligently connect customer data with data from other service providers.

However, service providers also benefit from this. The effectiveness of such a platform can only be achieved if the processes and IT are sufficiently sophisticated. This is usually the case for energy providers because their core energy processes alone demand this type of IT solution.

Developing this type of IT architecture creates the basis for a company to become a data-driven supplier. Data is collected from both internal and external company sources and combined with analyses and simulations to provide the basis for making more reliable decisions in today's dynamic and complex business world.

The responses that companies gave to the key questions below provided the starting point for identifying which IT solutions will best support various expert users in the future. The SAP solutions presented in the next section must be evaluated comprehensively and in relation to other competitive solutions. The openness of the technology provided with the new SAP solutions also enables a hybrid use of SAP and non-SAP components.

Key Questions

- Which business model is to be given priority in the future (low pricing policy or becoming both an energy-related and regional service provider)?
- What type of products and/or product combinations add value for customers?
- Who should be regarded as a potential competitor and what are their strengths and weaknesses?
- What are the strengths, weaknesses, opportunities and risks of the specialist processes and how can these be improved using IT support?
- How can errors or bad decisions and their consequences be identified at an early stage and how can subsequent decisions be made based on facts?

3. What does SAP offer as a Solution?

SAP will not only guarantee maintenance of current SAP R/3 installations on various database systems until 2025, but is also continuing to provide the necessary developments in the existing landscape.

In SAP S/4HANA, development is only provided for the SAP HANA Platform, which contains an in-memory database system. One reason for this is the significant improvement in performance. A single database platform also means that development capacity can be focused on providing applications quickly, rather than on providing a range of technical basis components. The platform also provides comprehensive data integration and database management services, in addition to the application development options available. This in turn means that cutting edge functions, such as machine learning, analytical algorithms, data virtualization, Hadoop & Spark integration, spatial applications and much more can be provided.

Whilst an SAP component was available to address every specialist requirement during the R/3 and IS-U implementation, we are now facing a far more complex situation. The increasing complexity of the specialist questions asked requires more sophisticated IT support solutions to be provided, even within the SAP product portfolio. This leads many users to believe that SAP does not have a strategy here. However, a closer look at the solutions offered quickly proves that this is not the case.

Effectively, there are two conflicting requirements here, which must be adequately addressed by the energy provider. On the one hand, customers of the energy provider rightly expect the same high level of quality at reasonable prices that they received previously thanks to standardized mass processes. On the other hand, there is a demand for individualized innovative and highly dynamic offers. Combining these two contradictory requirements requires the energy provider to use an open, integrated but secure IT architecture. SAP responds to this with software and service offerings that can be assigned to a bi-modal IT model as shown in Figure 7.

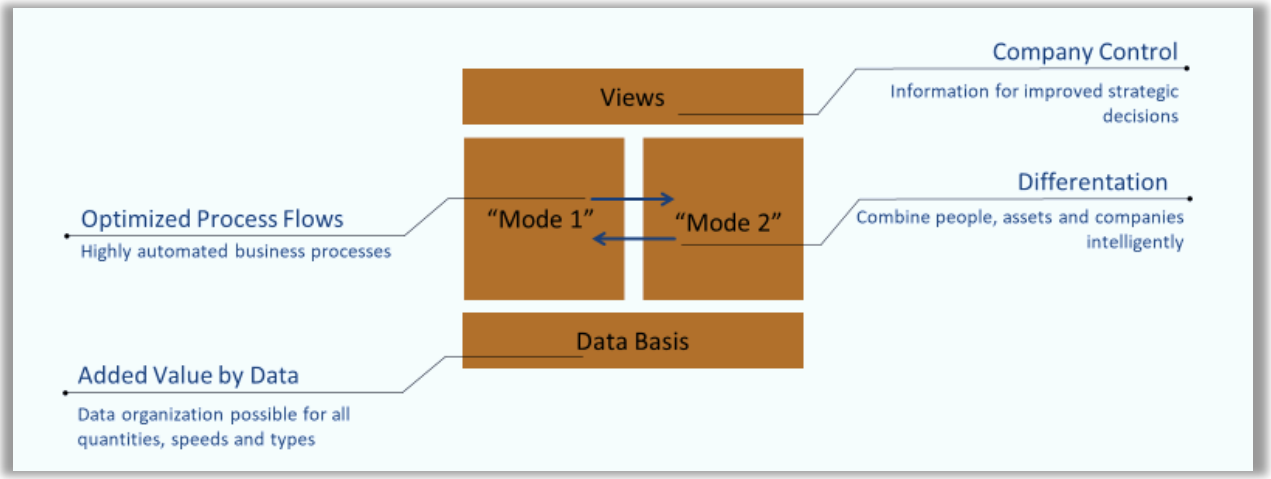


Figure 7: Bimodal IT Model According to Gartner [2] Based On [3]

The components found in the digital core (mode 1) provide high quality automated and standardized core processes, but are subject to long innovation cycles [4].

Essential functions, such as creating complex energy bills require a costly development process to provide stable mass transactions and are usually far less innovative.

The SAP S/4HANA Business Suite, and the ERP components in SAP S/4 can be used to represent a company's business processes and their integration, starting from purchasing and maintenance through to financial accounting and controlling, and allows real-time evaluation of any information received. This makes a high level of automation possible and the evaluations support both quality control measures and continuous process innovation.

IT operations in this core can be run both on-premise at the company, as was previously the case, or in the cloud using hosting providers.

The digital innovation platform (mode 2) provides many agile and scalable SaaS applications, which can be used to quickly implement company-specific business models which provide a competitive edge. The basis for these solutions is the SAP Cloud Platform, which SAP and third parties use to develop their own solutions. "Pay per use" licensing models allow temporary usage and in doing so provide the technical basis for agile product development. However, the full benefit of this increasingly open architecture can only be fully exploited if third-party solutions are conceptionally aligned with the SAP solutions. The scope of future interoperability will ultimately be defined by factors such as incompatible field lengths for names or addresses.

The connection between cloud solutions and the on-premise world is provided by various interfaces. Continuous development in the interoperability of SAP products, SAP acquisitions and third-party IT solutions ensures that data and information for integrated processes can be processed efficiently in heterogeneous IT landscapes. This provides consistent data and processes across various applications, which is ultimately the guarantee for process reliability and a tangible result that the energy company can present to the customer.

How will this affect the pending transformation process in the company? The decision to implement SAP S/4 HANA as a basis must be considered carefully according to the specific requirements of the individual business, since the various solution components required to perform a task are functionally different in the various platforms.

This is shown in

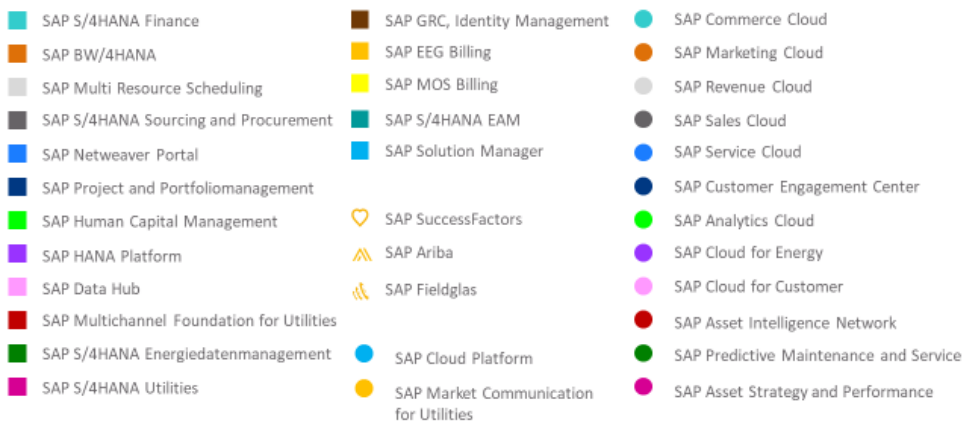


Figure 8. This shows that various SAP solutions can be provided for a function module, and that company-specific requirements will ultimately define the selection made. This is explained using the example of the demand for CRM functions.

SAP S/4HANA Customer Management supplies various customer contact management functions [5].

A common requirement is to be able to provide standardized communication across various channels, such as online centers, telephony and customer office or Facebook communication. Operating several channels in SAP S/4HANA Customer Management is just one of the requirements to be met by a front office (call center). Business models are increasingly moving towards new digital services and non-commodity products, meaning that various backend systems must be integrated with additional inbound channels, such as chat or online shops. The cloud component SAP Customer Engagement Center makes this possible. It creates the connection to a customer and provides the interactions saved for this customer.

The solution that you ultimately choose will be dependent on both its availability and economic factors, but most of all by the direction in which you want your business to develop.

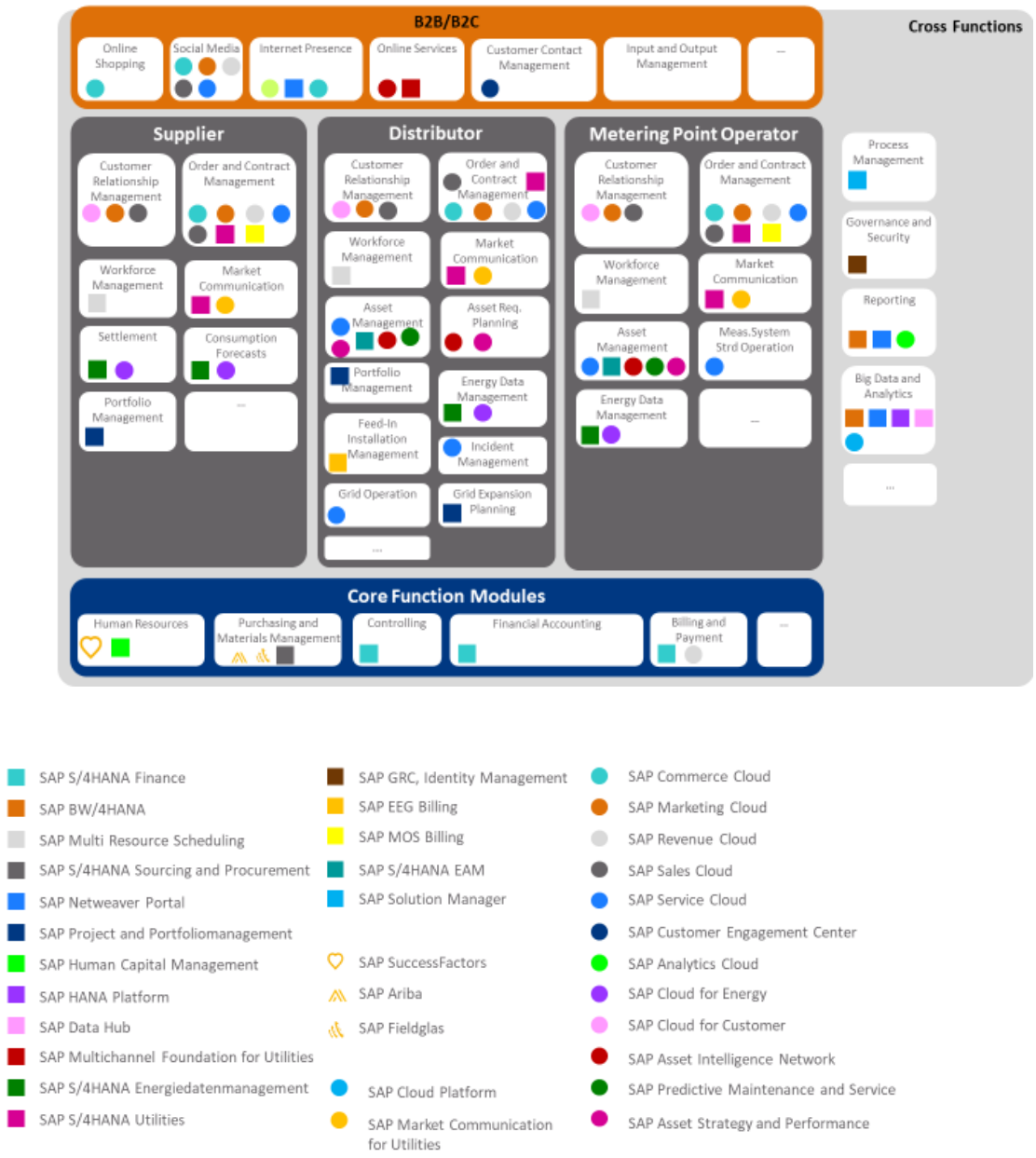


Figure 9: SAP Solution Portfolio for Various Function Modules (Not Complete)

To ensure that the correct decisions are made and to exploit the maximum potential from the transformation process, it is essential that the way in which expert users collaborate with IT is strategically realigned. Technical migration to the new solutions is significantly less complicated than the change management required during process definition and development of future employee skills required. Expert users and IT should therefore collaborate to resolve the challenges raised by this change process.

SAP S/4HANA is the next generation business suite from SAP, which uses a digital core to implement Enterprise Resource Planning (ERP) requirements. It replaces the existing SAP ECC and has been developed specifically for the use of SAP HANA.

SAP S/4HANA provides holistic process support, without having to change media, for example by switching to a business warehouse to create a report or having to perform manual steps beyond the SAP system. Other examples of simplification are [6]:

- Simplification of the entire system architecture, program structure and data schema. SAP S/4HANA has almost 50% fewer code lines, tables and data elements when compared to SAP ECC 6.0. Reduced maintenance, shorter innovation cycles, faster system response and therefore improved performance are just some of the benefits this provides.
- SAP S/4HANA is based on the in-memory platform SAP HANA and not on relational database systems, as was the case for the legacy systems. The new technology used means data can be retained completely in the memory for analysis or processing purposes, and does not have to be copied to the memory from the hard drive as was previously the case. Transactional and analytical processes can therefore be performed in the same system. This facilitates almost real-time processing and analysis of large data volumes.
- SAP S/4HANA with its SAP Fiori interface scores highly in terms of intuitive usage and enhances productivity. Mobile apps, modifications and enhancements can be provided on a standard development platform, so that end users can use identical interfaces and functions. Users who are familiar with the processes only require minimum training to use the software.
- Some SAP products are no longer required, and their functions have been incorporated in SAP S/4HANA, such as parts of SAP Customer Relationship Management. Reducing the number of interfaces required also increases process stability. Infrastructure and operating costs can be lowered by eliminating the need to store redundant data.

The SAP S/4HANA ERP components, such as SAP S/4HANA Finance not only replace the existing solutions, but also provide significantly more functionality in an intuitive format that supports simplified processes. The logistical core component is SAP S/4HANA Supply Chain. Customer orders are represented using SAP S/4HANA Sales, and procurement processes are represented using SAP S/4HANA Sourcing and Procurement directly in the digital core. Inventory management, material requirements planning, capacity planning, sales and purchasing should all benefit from simplification.

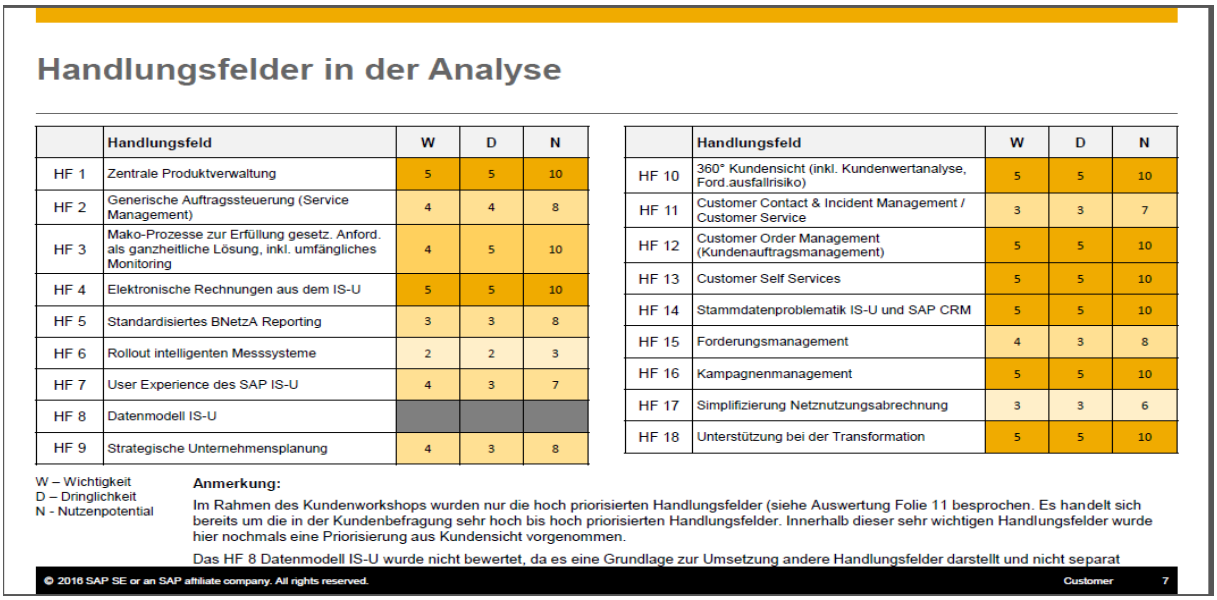
SAP S/4HANA Finance provides a new data model. The integrated posting document (universal journal) plays a key role here. It links information from Financial Accounting with Controlling. It is no longer necessary to compare data from both areas and internal and external accounting are constantly aligned. This means that monthly closing can be performed more quickly, since far fewer tasks are required here. We expect companies to be able to implement organizational improvements in the medium term. [7]

The Success Factors solution is a new product that can be used to represent Human Resource Management processes. However, this solution focuses on the areas of talent management, benefits and compensation, personnel development, successor planning and training. Payroll accounting and time accounting including specific German requirements are not part of the Success Factors solution. A new solution developed on the basis of SAP S/4HANA functionality is planned to represent these processes as of 2023.

SAP S/4HANA Utilities can be regarded as the technical development successor to the existing SAP R/3 IS-U system. All functions that are currently available are also available in SAP S/4HANA. Some functional changes, such as replacing the current Customer Interaction Center (CIC0), must however be included in the initial conversion to SAP S/4HANA Utilities, meaning that it may be necessary to add additional SAP products here. All changes made by SAP to the current SAP system used are shown in a simplification list [8], and must be observed during the project planning phase.

Implementing SAP S/4HANA Utilities in the S/4 environment means that a semantic full text search, an overview of key figures during processes, and dynamic filter criteria can be accessed at any time. Analysis and operational reporting directly on transaction data improve the overview of day to day operations, and allow tasks to be prioritized accordingly. The modern interfaces provided by SAP Fiori increase productivity and enable users to handle more complex tasks efficiently. The development of role-based functions means users only see the fields that they require to perform the respective task. This significantly reduces the training effort required. A central product catalog not only simplifies product modelling, but also provides a better overview of the increasingly diverse range of energy and bundle products available. Using machine learning technology to process exceptional cases automatically (such as implausible meter reading results, outsorted bills) will reduce the number of routine tasks to be performed by users in future. SAP S/4HANA Utilities can be run as an on-premise solution or as a private managed cloud, which is hosted and managed by SAP. [9]

Additional SAP solutions will also be provided for the energy sector. Major requirements identified by utilities companies have already been implemented in these solutions. The overview of prioritized focus areas shown in Figure 9 was created in close collaboration between users and SAP as early as 2016, and was presented and discussed by the working group meeting of the DSAG in May 2017.



Handlungsfelder in der Analyse

	Handlungsfeld	W	D	N
HF 1	Zentrale Produktverwaltung	5	5	10
HF 2	Generische Auftragssteuerung (Service Management)	4	4	8
HF 3	Mako-Prozesse zur Erfüllung gesetz. Anford. als ganzheitliche Lösung, inkl. umfängliches Monitoring	4	5	10
HF 4	Elektronische Rechnungen aus dem IS-U	5	5	10
HF 5	Standardisiertes BNetzA Reporting	3	3	8
HF 6	Rollout intelligenten Messsysteme	2	2	3
HF 7	User Experience des SAP IS-U	4	3	7
HF 8	Datenmodell IS-U			
HF 9	Strategische Unternehmensplanung	4	3	8

	Handlungsfeld	W	D	N
HF 10	360° Kundensicht (inkl. Kundenwertanalyse, Ford.ausfallrisiko)	5	5	10
HF 11	Customer Contact & Incident Management / Customer Service	3	3	7
HF 12	Customer Order Management (Kundenauftragsmanagement)	5	5	10
HF 13	Customer Self Services	5	5	10
HF 14	Stammdatenproblematik IS-U und SAP CRM	5	5	10
HF 15	Forderungsmanagement	4	3	8
HF 16	Kampagnenmanagement	5	5	10
HF 17	Simplifizierung Netznutzungsabrechnung	3	3	6
HF 18	Unterstützung bei der Transformation	5	5	10

W – Wichtigkeit
D – Dringlichkeit
N - Nutzenpotential

Anmerkung:

Im Rahmen des Kundenworkshops wurden nur die hoch priorisierten Handlungsfelder (siehe Auswertung Folie 11 besprochen. Es handelt sich bereits um die in der Kundenbefragung sehr hoch bis hoch priorisierten Handlungsfelder. Innerhalb dieser sehr wichtigen Handlungsfelder wurde hier nochmals eine Priorisierung aus Kundensicht vorgenommen.

Das HF 8 Datenmodell IS-U wurde nicht bewertet, da es eine Grundlage zur Umsetzung andere Handlungsfelder darstellt und nicht separat

Figure 10: Prioritized Focus Areas in the Utilities Sector for SAP [10]

From the start of 2019, SAP is planning to make the “Software as a Service (SaaS)” solution “SAP Market Communication for Utilities” (Maco) available to its customers in various iteration phases. A standard adapter can be used to integrate standardized end-to-end market communication from the cloud in the energy provider’s SAP system. The objective here is to support all relevant processes and data exchange formats, which are defined by the regulatory requirements. As a result, market-compatible process management can be provided in a single solution within the SAP environment for the first time. The benefits to the customer are as follows:

- Proactive complete adoption of the solution by a provider if the regulatory requirements change, both in terms of formats and processes.
- Significant reduction in development, testing and training expenditure.
- Integrated end-to-end monitoring of market communication in the customer system.
- Low CAPEX costs thanks to the subscription model.
- Key users in IT and relevant departments have more time to spend on innovative and business-enhancing projects.

This solution is expected to add value to both daily operations, but also to periodic changes that are made at regular intervals. This transformation will require the content of the modules that were previously supplied as IDEX components to be reorganized.

The utilities industry also has additional functional requirements beyond the requirements covered by SAP S/4HANA Utilities and the market communication solution.

This is in line with the request to have alternative provisioning concepts. SAP presented a roadmap in September 2017 about this, which is to be implemented over the next three years. A comprehensive SaaS-based solution portfolio that reflects industry-specific processes is to be created for both the supplier and distributor market roles, which can be used as an alternative or an enhancement to the existing on-premise platform. This cloud portfolio is not intended to be a direct replacement of the functions in SAP S/4HANA Utilities, but can be regarded as an alternative for business processes that have been radically simplified. SAP places particular focus on the option of also being able to use the new solution portfolio in hybrid scenarios. This provides existing customers with flexible options regarding whether, when and to what extent they wish to implement SaaS components in the future. SAP intends to offer a usage-based licensing model for these solutions to improve scalability for companies.

In addition to the cloud solution “SAP Market Communication for Utilities” mentioned previously, the following are significant elements of the SAP for Utilities Cloud-solution:

- SAP C/4HANA solution portfolio (known previously as SAP Hybris),
- Cloud-based SAP S/4HANA components (such as Ariba, …) and
- Some industry-specific or cross-industry new developments, such as Cloud for Energy or the SAP Asset Intelligence Network.

The following sections only cover SAP solutions that are required to understand the two reference models shown in chapter 4.

The SAP Revenue Cloud is an agile means of bundling new offers consisting of various products and services in a single offer, order process and bill. It is based on a flexible, microservice-based SaaS architecture and can be combined with SAP C/4HANA solutions for commerce, sales, service and marketing. Integration with backend processes, such as market communication and accounting is also planned. [4]

The SAP Marketing Cloud provides real-time transparency about the effect of marketing measures. Targeting specific customers in segments that are largely similar requires support in generating dynamic customer profiles and identifying customer motives and intentions. Powerful segmentation tools, personalized interactions during the purchasing process, customer retention management that includes incentive systems for customer interactions provide customer retention methods that have become established in other sectors quickly on a scalable basis. [4]

SAP Cloud for Energy provides the best support for current and future data management requirements in energy markets by entering, saving and evaluating large data streams at regular intervals. This means that energy providers have constant access

to a real-time view of their data (such as smart meter reading, grid usage, predicted requirements) and can use this information to make better business decisions. [4]

Various options are provided for integrating both the cloud and on-premise components presented here and third-party software products. Various levels of data, function, process and presentation integration are supported here.

BAPI, IDOC or Web services from the on-premise environment provide familiar application interfaces. SAP Cloud Platform services (SAP Cloud Platform integration) are used to connect to cloud components. This makes it possible to integrate both cloud components from SAP with those from third parties, and SAP cloud components with on-premise components from SAP and third parties across four levels using graphical interfaces. Pre-configured templates are used to integrate SAP products to keep the integration effort required to a minimum.

The SAP HANA platform provides simplified options for data and functional integration, which do not compromise data persistence. It is for example possible to incorporate external data sources in real time without having to perform a data replication. This ensures that unauthorized changes are not made to data copies and also significantly reduces the memory requirements for application data. SAP HANA Enterprise Information Management and the SAP Data Hub also provide additional tools for data cleansing, preparation and enrichment. This makes it easier to create reports and key figures. Adopting S/4HANA is then not just a decision about a single application, but is rather a conscious decision to run IT on a modern platform, which is fit to face new challenges.

Key Questions

- Which processes are currently well organized and adequately supported by your existing IT solutions? (Should be retained)
- What are the new requirements for your processes and what IT support is required? (Should be changed)
- Have you considered future business strategies in the requirements you have identified?
- Are you suitably familiar with the available and planned IT products provided by both SAP and third parties? What is the cost and risk associated with various possible solutions in achieving a suitable level of product maturity for your business?
- How does assigning a solution to one of the bi-modal IT model categories affect functionality, operating models and integration capability? Where do you need innovation and where is stability more important?

- What level of integration do IT solutions need to provide meaningful feedback to customers and identify the technical and economic aspects of decisions made.
- How will deploying new IT technologies, such as artificial intelligence, Internet of Things or Industry 4.0 affect your business model?
- How can the software provider provide an agile response to changing requirements when planning the transformation strategy on a long-term basis?

4. Transformation Scenarios

Requirements are compared with possible solutions available to create a roadmap for the future IT landscape. The next task is to develop a company-specific roadmap for the transformation process. The two variants shown below are intended to provide some possible suggestions here. The models selected here do not represent the actual number of customers and points of delivery, but rather use different technical architecture and a different number of SAP solutions and systems. They may need to be adapted to meet specific company requirements.

In reference model A, the function modules from Figure 5, which are highlighted in light blue in Figure 10, are supported by the corresponding SAP solutions. Corresponding SAP solutions are also available for the other function modules. However, these requirements have been implemented using other solutions in the reference model.

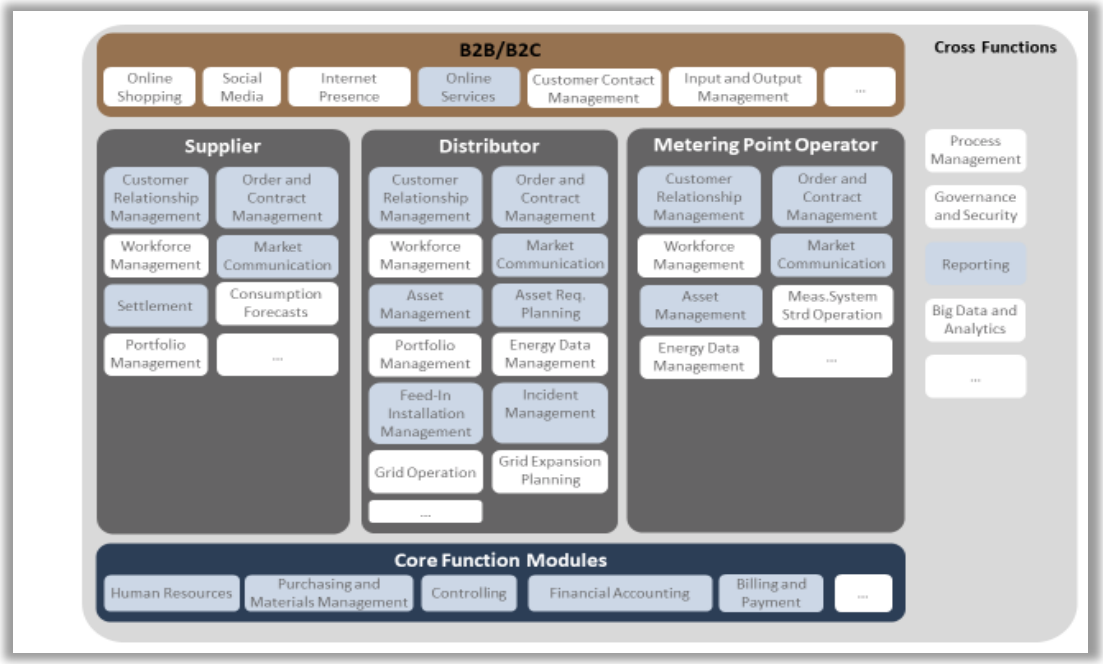


Figure 11: Reference Model A – Function Modules Used

This reference model uses an integrated SAP solution. This means that existing ERP processes and utilities-specific processes, which are supported by SAP IS-U, are represented as separate clients on a single SAP instance (SAP IS-U and ERP). The role of the metering point operator is represented here in the “Distributor” client.

Independent SAP Human Capital Management (SAP HCM), an SAP Business Information Warehouse (SAP BW) and a system for online services (SAP UCES) are also used here. In addition to the SAP systems, an external converter is also used in combination with the IDEX functions in SAP IS-U for market communication. Figure 11 summarizes the IT landscape for reference model A without showing the interfaces between the individual systems. Other third-party software systems, which are connected using interfaces, are also available, but are not covered here in the interests of simplicity.

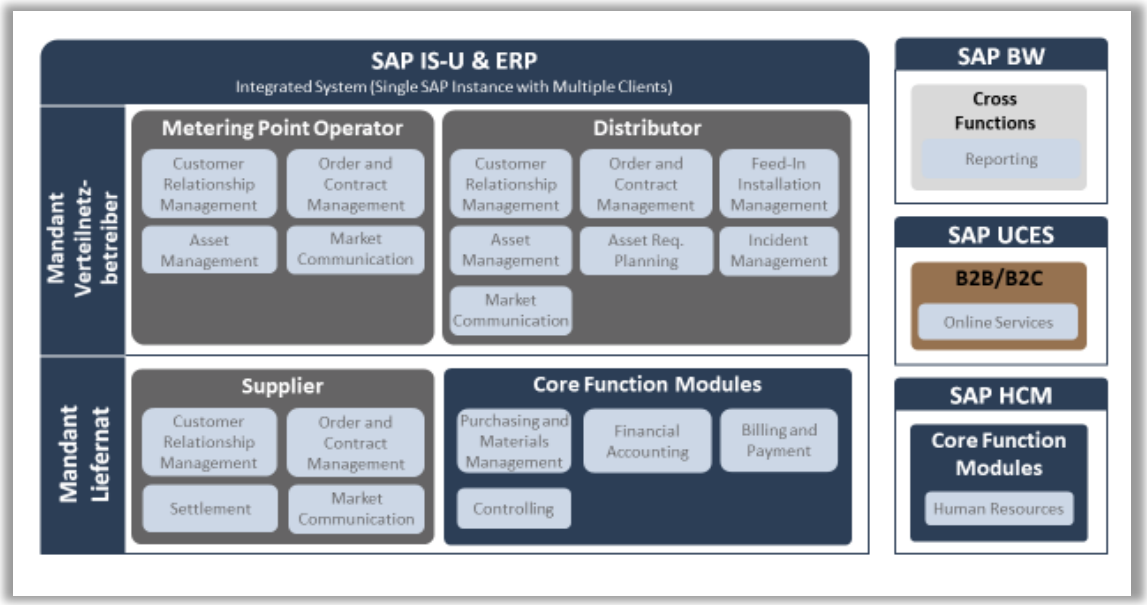


Figure 12: Reference Model A – IT Landscape

A target architecture for this IT landscape is shown below. The extensive SAP portfolio means that companies can choose between several options when implementing the target architecture. An extended product portfolio that uses commodity products may also of course require complementary IT solutions. The operating models in the SAP products range here from a pure cloud solution to a hybrid solution. You can also make a company-specific selection for some solutions. Others are only available in a specific operating model. A landscape that only contains an on-premise solution can be ruled out in the future. As a result, the current IDEX solution will in future be moved to a new cloud solution, to make the frequent format and process changes demanded by market communication more cost efficient and less resource-intensive. When you think that data exchange between companies currently takes place on the public Internet, this by no means compromises data protection, but rather increases its professionality whilst simultaneously reducing costs in this sector.

The planned SAP solution portfolio could be used as the basis for selecting a target architecture for reference model A as shown in Figure 12.

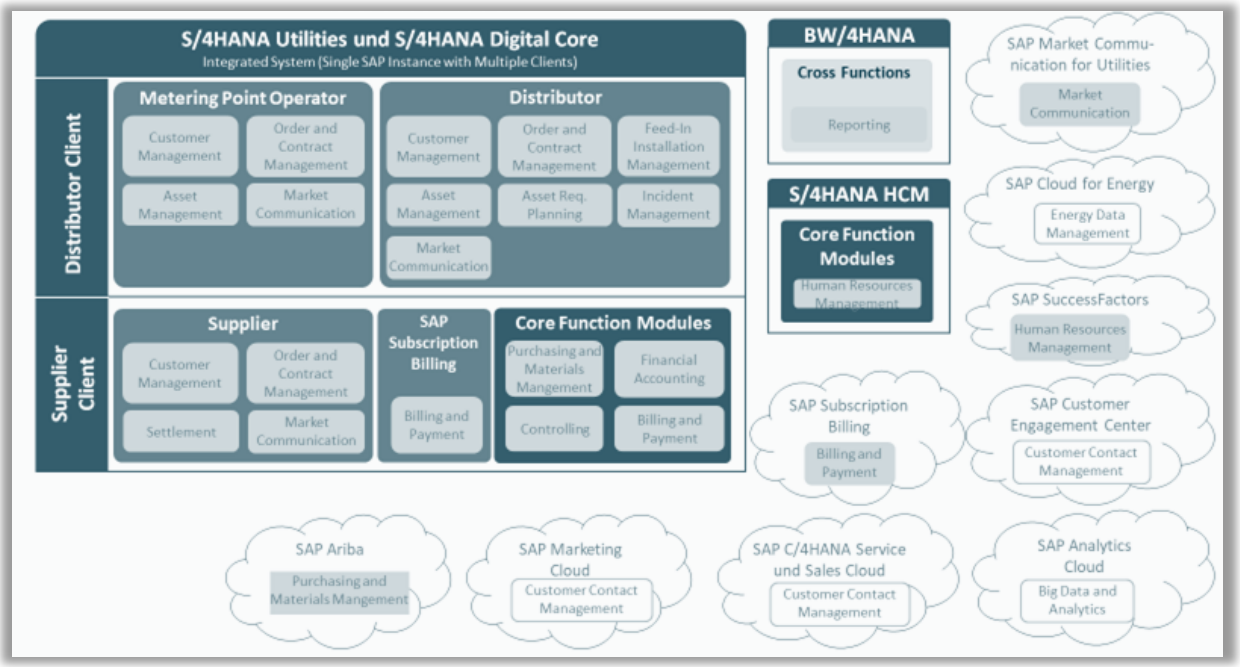


Figure 13: Reference Model A – Possible Target Architecture

The Digital Core in SAP S/4HANA is used here to provide ERP functions for Controlling, Finance and Accounting, Purchasing and Materials Management. SAP Ariba can for example be added to purchasing to automate the tender, allocation and billing processes.

Human Resources are supported by the on-premise solution SAP S/4HANA HCM, to which SAP Success Factors has been added to the areas of talent management, benefits and compensation, personal development and successor planning and learning.

SAP S/4HANA Utilities is still used to perform mass billing for core business, to ensure that these processes remain stable and accurate. SAP's efforts to simplify grid usage billing will further enhance this. In future, new billing models for new business areas with non-commodity products and services can be managed using SAP Subscription Billing to provide the flexibility and dynamic billing features required.

The 360-degree view of the customer is a key focus area in customer contact management. Various solutions are possible here. SAP Customer Management was developed by reintegrating individual CRM functions, and can replace the previous transaction CIC0, which is no longer being developed. Alternatives here are the SAP Customer Engagement Center (CEC) or the SAP C/4HANA Service and Sales Cloud, which all provide functions for customer contact management, which greatly

exceed the existing requirements identified. If additional requirements exist for customer processes, such as for customer segmentation or marketing campaigns, the SAP C/4HANA kit with SAP Marketing Cloud, SAP Commerce Cloud or SAP Customer Data Cloud provides integrated enhancements to the SAP Service and Sales Cloud.

As already explained, the SaaS solution MaCo Cloud is used to implement marketing communication to significantly reduce development, test and training costs, and to use a solution that has been standardized for all utilities companies.

The Business Information Warehouse is used to implement the reporting functions required. The SAP Analytics Cloud has been added to it for the Big Data and Analytics area.

A standardized consistent dataset is required to integrate various function modules. Mutually aligned development processes during software creation ensure that information flows are transparent and that data is processed correctly. The “industry standard "of a large manufacturer, who compensates for a non-standardized industry data model, means that smaller solutions from third-parties can be incorporated whilst ensuring information flows remain consistent.

In reference model B, the function modules from Figure 5, which are highlighted in light blue in Figure 14, are supported by the corresponding SAP solutions. Unlike reference model A, this also includes energy data management and customer contact management. The requirements for the other function modules have been implemented in other solutions here.

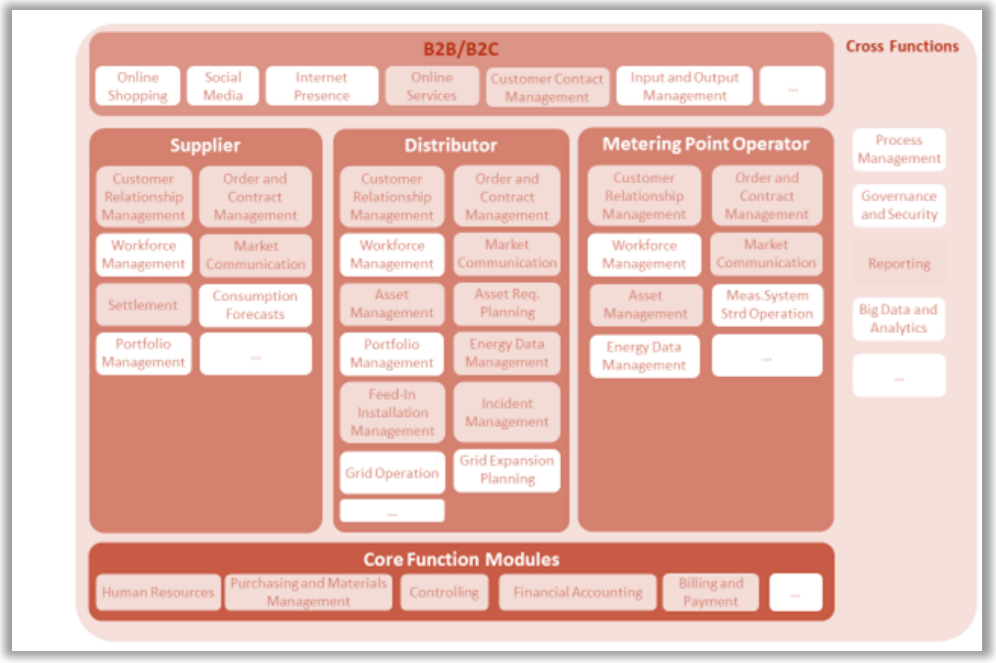


Figure 14: Reference Model B – Function Modules Used

The IT architecture shown in this model is functionally more sophisticated. Separate SAP instances are for example available for existing ERP processes and utilities-specific processes in sales and on the grid that are supported by SAP IS-U. The meter operator role is also represented by a separate SAP instance. This is enhanced by a separate instance for SAP Human Capital Management and the SAP Business Warehouse. An SAP CRM system, which also runs on a separate SAP instance completes the SAP landscape. In addition to the SAP systems shown in reference model A, an external converter is also used in combination with the IDEX functions in SAP IS-U for market communication. In Figure 4, the IT landscape for reference model B is summarized without showing the interfaces between the individual systems. Other third-party software systems that are connected using interfaces are also available here but are not covered by this document.

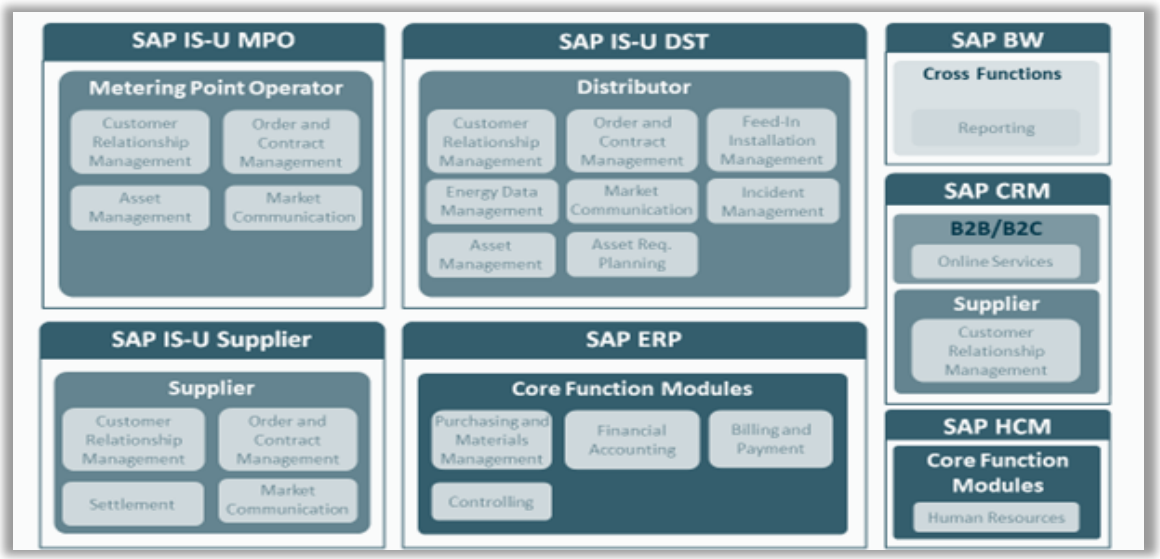


Figure 15: Reference Model B – IT Landscape

Figure 15 shows one variant of a possible target architecture as an example.

The only difference to the target architecture used in reference model A is the use of SAP Cloud for Energy for energy data management issues.

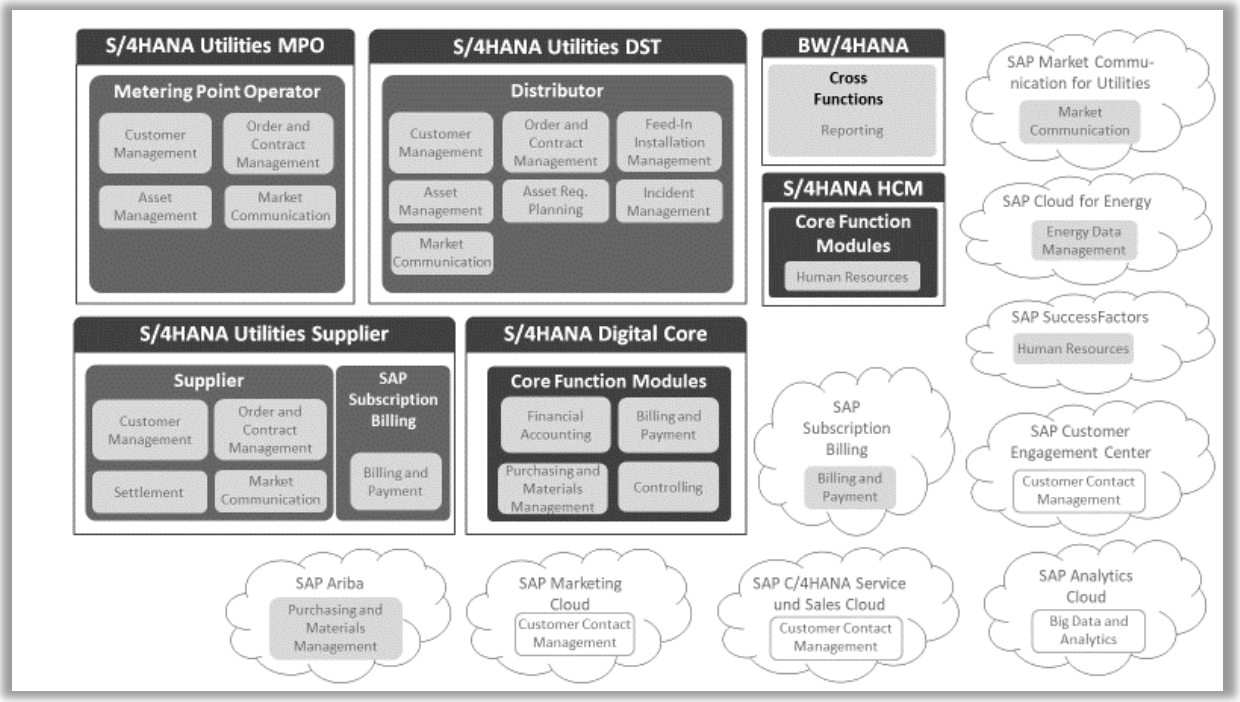


Figure 16: Reference Model B – Possible Target Architecture

Both models show additional cloud products, which require further investigation regarding their suitability for individual company projects.

To develop a specific transformation schedule, we recommend following the procedure shown in Figure 16. A preliminary project is initiated first, in which the target version of the IT architecture is specified using the planned business model, product strategies and business processes required. A company-specific roadmap can be created on the basis of this target architecture, which should observe both the system conversion, but also should ensure that skills in the specialist areas are adjusted in good time. In this context, it is vital that existing processes are evaluated again to leverage transformation in IT support, eliminate any redundant tasks that do not add value and to use the new technical options available for improved decision making in an increasingly dynamic business world driven by low margins.

In technical terms, a pure database migration to SAP HANA can be performed initially, which is followed by the conversion of the SAP systems to SAP S/4HANA and SAP Cloud solutions.

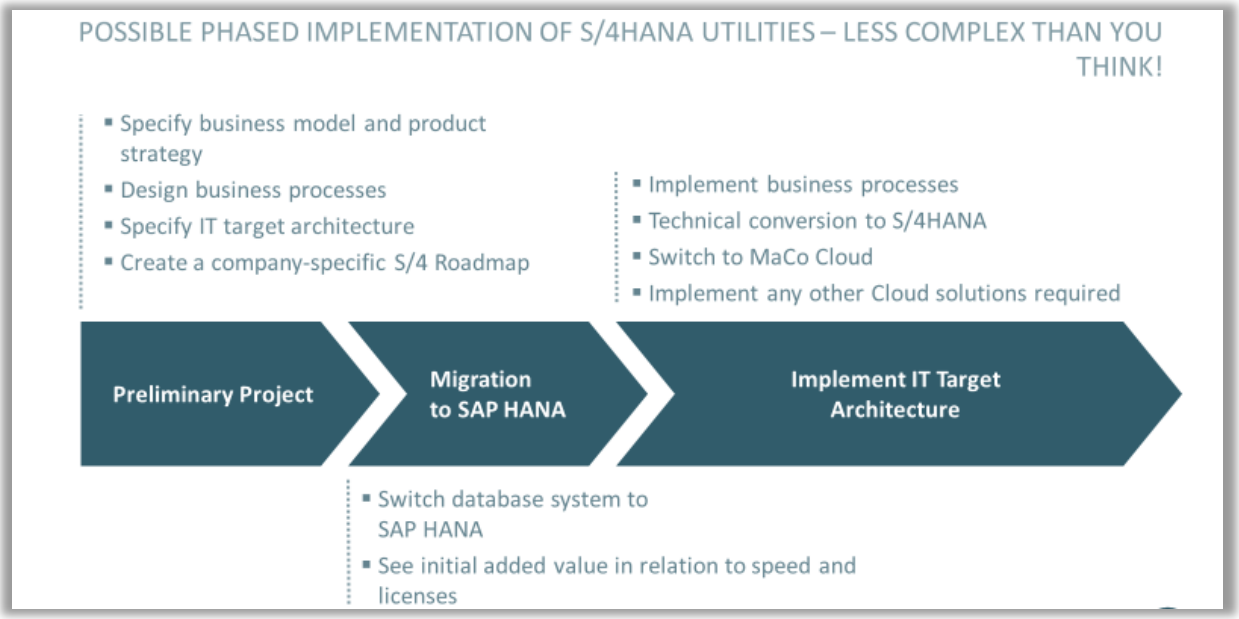


Figure 17: SAP S/4HANA Transformation Procedure

Reports from several companies about both previous projects and database migration to SAP HANA can help you to identify the benefits and pitfalls of your own project at an early stage. [11] [12] [13]. However, DSAG contacts mean it is also possible to establish contacts beyond the German energy sector and in other sectors who can share valuable information.

Converting to an SAP HANA database system assumes that the license requirements and the hardware requirements for the target landscape have already been clarified. Sizing tools from SAP help to scale the hardware accordingly. Exchanging best practices here can also help to reduce costs. When converting licenses to SAP HANA, the notice periods for existing maintenance contracts for the database system used previously must be observed.

Simply bringing forward the switch to in-memory database technology can bring significant benefits for process optimization. Shorter runtimes mean business processes can be monitored at shorter intervals. This facilitates faster response times within the business processes.

In a second step, conversion to SAP S/4HANA should take place at application level.

A “one-step procedure”, in which the database conversion and the functional conversion are performed simultaneously is also possible.

The required components are not yet available for a system based on reference model A, in which SAP IS-U and ERP are run on a single platform for all market roles. In the case of a system architecture that corresponds to reference model B, some of the functional changes required can already be made.

In both cases, enough time should be scheduled to perform both the preliminary project and database migration tasks, but also other pending tasks, due to the anticipated complexity of the transformation process.

The type of migration you choose will ultimately depend on various factors, such as available resources or time. The advantages and disadvantages of both variants have been summarized in Table:

Table 1: Advantages and Disadvantages of One and Two-Step Transformation

	One-step procedure	Two-step procedure
Advantages	• Faster conversion to the target landscape • Reduced overall project costs thanks to optimized project and test management	• Early use of native SAP HANA functions • Reduced project complexity • More time available to align employee knowledge and experience.
Drawbacks	• Increased project complexity	• Longer system downtimes due to two separate conversions • Higher overall project costs thanks to increased project and test management requirements

The IDEX products function used to manage market communication for the German market was previously implemented as a modification to the SAP standard. As part of the re-standardization process to improve the solution offered, the cloud solution SAP Market Communication for Utilities will replace the functions it provided. In addition to the converter functions and monitoring options, this will also involve a connector solution for backend integration to incorporate the relevant business processes. By using this solution as a service, you should be able to reduce the format adjustment and technical monitoring effort required on a long-term basis.

In the case of migration projects, this means that unlike the international market, converting to SAP S/4HANA Utilities is only possible for the German market by implementing this new solution on a step by step basis. You should therefore check individually which steps require which solutions and when these can be provided. The highly agile nature of development at SAP means it is possible to respond to industry requirements. Close dialog with users as part of the DSAG forms part of the basis for this, but also enables users to compare their own plans with the SAP roadmap.

To keep the period where maintenance costs are due for both existing database systems and the HANA database system to a minimum, once you have acquired the license, you should completely replace the legacy database as soon as possible.

Personnel costs associated with a pure database conversion are usually fairly low. Reference values from two projects are available in the table in the appendix.

Table 2 contains examples for targeted savings as a result of a database migration to SAP HANA.

Table 2: Examples of Savings Achieved

EON Energie Deutschland	10-fold database compression
Lufthansa	Up to 30% lower IT costs (TCO)
EMC Corporation	4 x faster data extraction
Vodafone	Up to 25 x faster data transformation and loading
Genband Inc	25 % reduction in the IT total cost of ownership
Northrop Grumman	75% faster real time analytics
Dole Packaged Goods	3-fold reduction in nightly batch runs
Toyota Engineering	20% reduction in complexity in standard reports

By switching to a different database technology, it is possible to streamline the database level and in doing so consolidate systems.

However, combining functions in SAP solutions as part of the following SAP S/4HANA transformation can also mean that some systems are no longer required, such as the reintegration of SAP Customer Management in S/4 HANA. This not only allows daily operations to use fewer systems but also means redundant data can be avoided. In the case of business processes that were previously run using several systems, you will also see that avoiding replication eliminates one potential source of errors. This in turn reduces IT costs and costs in departments responsible for operations, maintenance and error resolution.

The following sections present two example road maps for the SAP S/4HANA transformation for the reference models described above. The objective here is to show that the transformation process can be performed as a series of steps, but should be started in good time to provide the business with the modern functions required before the standard maintenance period expires, and to ensure that employees are empowered to use the new tools efficiently.

It should also be mentioned here that the roadmaps displayed here are only intended to be used as examples.

Conversion to SAP S/4HANA is performed in several different ways in the reference models displayed. Whilst in reference A, there is a direct dependency with IS-U, in reference model B it is possible to convert the individual SAP systems separately. The benefit of this is that conversions can be performed independently, and that the ERP area can already be converted to SAP S/4HANA, even if the utilities area cannot be converted until the market communication services become available. A possible schedule variant is shown in each target architecture for the reference models presented. Internal projects and other requirements can significantly affect this, meaning that it may need to be adjusted during the actual implementation.

The schedule for reference model A is shown in Figure 17 and the schedule for reference model B is shown in

Figure 18. The earliest possible time is selected here to show the benefits of using the new technology.

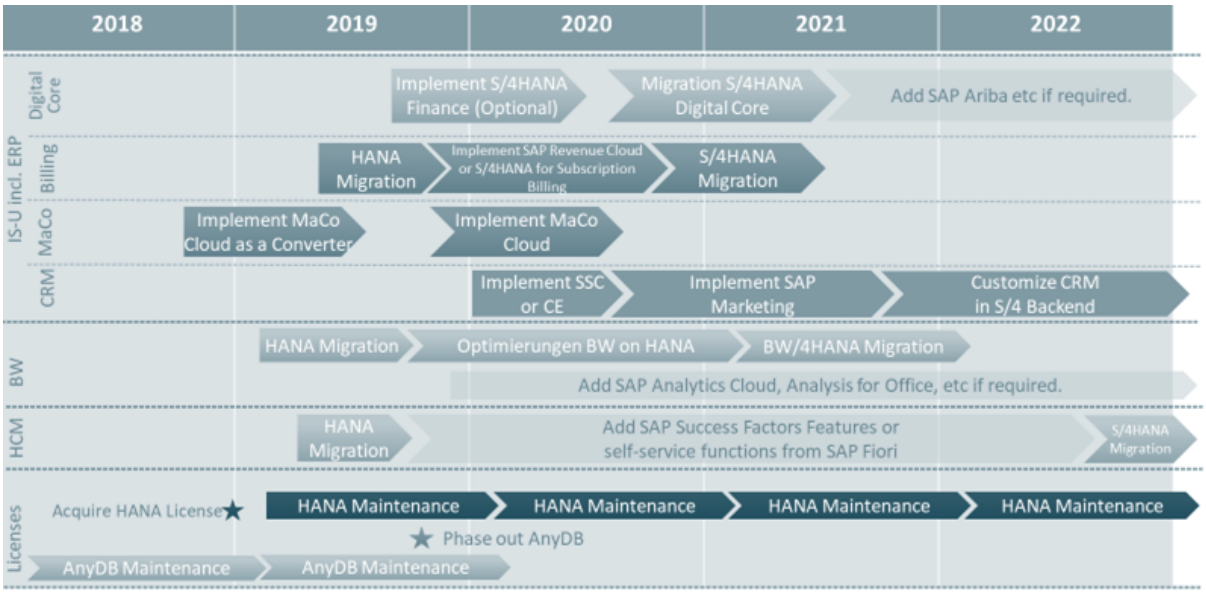


Figure 18: Reference Model A – Schedule

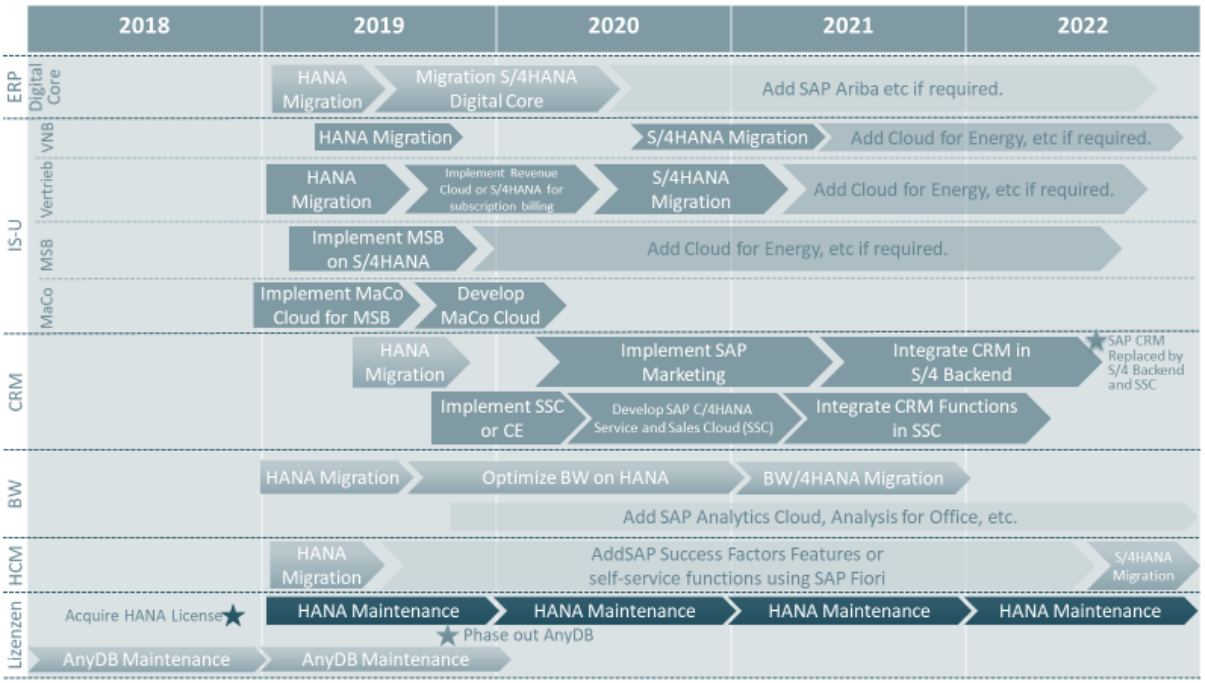


Figure 18: Reference Model B – Schedule

The issue of reducing the period in which parallel maintenance costs exist for the new and old database has already been raised. In the case of the two-step procedure described above, this is almost certainly easier to implement than if the go-live requires a complete functional change. This means that a two-step procedure is used as the basis in both plans.

The SAP HCM system is used as an independent system in both reference models. Since a solution that is based on SAP S/4HANA is not planned until 2023, a SAP HANA database migration only has been planned for this system in the schedules displayed. We recommend monitoring the development of the HCM solution and modifying the schedule according to the SAP roadmap. Complementary products, such as Success Factors can be introduced independently of the SAP S/4HANA timescale. In IT landscapes in which the SAP HCM system runs as an integrated solution in the SAP ERP system, this must be separated during the SAP S/4HANA transformation process.

Migrating the Business Information Warehouse Systems to HANA makes new options available thanks to HANA optimizations. These can be implemented before performing an SAP BW/4HANA transformation at a later point. This is planned for both reference models even if the other source systems have been transformed to SAP S/4HANA. In parallel to SAP HANA migration, you should check whether products, such as SAP Analytics Cloud or Analysis for Office can add value to specialist areas or can enhance reporting.

As described for the target architecture, SAP S/4HANA Customer Management, Customer Engagement Center (CEC) or SAP Cloud for Customer (C4C) provide alternative products that can be used to represent processes in the existing CIC. These solutions also provide other processes and functions which can add value to customer service. However, C4C or CEC can be introduced independently from the HANA database conversion and SAP S/4HANA transformation, and can be used in combination with the existing SAP IS-U systems. This creates independence from the overall project and means the work required can be distributed over a longer period.

Re-integrating CRM with SAP S/4HANA Utilities makes CRM back office functions available in SAP S/4HANA.

Bringing the introduction of the C4C or the CEC forward in combination with the CRM functions supplied in SAP S/4HANA means many CRM functions can be provided, which can be extended to form a complete CRM solution by extending the SAP C/4HANA Marketing functions. You can introduce and define a CRM system, on a modular basis and in parallel to the SAP S/4 HANA transformation for reference model A.

A similar approach is possible for reference model B. Migrating SAP CRM to a SAP HANA database system means expert users can use the system in new ways. In addition to continuing to run SAP CRM on HANA, you can also introduce C4C if necessary. Even in this reference model, CRM back office functions, to which you can add additional SAP C/4HANA products, provide a comprehensive CRM system to replace IS-U. A transformation path with future SAP solutions is therefore also available for the CRM system in reference model B.

Both schedules for transforming the SAP ERP system are different due to the different operating models involved.

The SAP ERP modules are run on an integrated basis with SAP IS-U in reference model A. This means an SAP S/4HANA transformation can only take place for the entire system, meaning that both SAP ERP and SAP IS-U, are involved. If the SAP S/4 HANA transformation is to be brought forward to reduce the conversion effort and complexity, you can consider two options.

In the first variant, the SAP ERP components are decoupled and run as an independent system, meaning that the schedule from reference model B can be adopted.

The second variant involves installing the SAP S/4HANA Finance add-ons for the FI and CO modules. This enables these modules to be run on the basis of the SAP S/4HANA functions in a compatibility mode in the existing system. However, this version is no longer being developed.

Since SAP ERP is already being operated as an independent system in reference model B, you can already migrate this system to SAP S/4HANA and migrate the other systems later once the SAP components required become available. You can use the one-step or two-step procedure for the migration. We recommend converting the SAP ERP system at an early stage, so that valuable conversion and operation experiences gathered can be used for the other systems, and to ensure better allocation of resources required for all systems during the entire SAP S/4HANA transformation period.

The phased introduction of the market communication solution described above is scheduled for the beginning of 2019. This defines when SAP S/4HANA Utilities can be used. In practice however, this will not represent a restriction for projects, since the steps required independently of this in the company will firmly commit available resources. The schedules shown are also based on the assumption that the target model is available for market communication prior to the migration, and that SAP components will be provided according to the roadmaps that have currently been communicated.

Key Questions

- What time frames does your company require to allocate the necessary resources to migration projects?
- How will consultant market availability change once R/3 standard maintenance finishes?
- When do you require which functions for your business? What value is to be added by introducing new solutions?
- What costs do you see being associated with developing your employee knowledge and skillset? What resistance do you expect?
- How can a reduced level of automation be compensated for by re-standardization and less mature new software products?
- By when will it be possible to develop a company-specific IT target architecture?
- What third party software is required and what needs to be considered here?
- What license, hardware and operating costs are to be anticipated?
- What integration options must be provided in the cloud and on-premise solutions for converting business models and solutions from third parties?

5. Summary

Energy providers are currently facing a period of sustained transformation. Liberalization and energy reform combined with increasing competition and a more easily accessible market require digitalization in the energy sector to undergo significant development. Established business models are being questioned, new competitors are forcing their way into the market, customer requirements are increasingly changing and even the regulatory framework is volatile. This situation makes it is essential for energy providers to define their strategic positioning within the market. This produces IT requirements, which are to be met by future IT architecture.

The current solution portfolio offered by SAP is extremely diverse and subject to continuous development. A more open market means that modern development methods can be combined with suitable solutions from third parties. Since each business strategy is unique, this demands an open selection of suitable IT solutions and operating models. Both cross-industry and international developments within the energy sector help SAP cope with the significant development effort required and provide an excellent basis for providing experience-based practical solutions. The economic stability of SAP provides the required continuity in terms of solution availability.

SAP's announcement that they will only provide standard maintenance for their existing SAP R/3 solution until 2025 has prompted many companies to consider restructuring their IT architecture.

SAP has assured energy providers that they will continue to provide additional solutions that provide the best support for the processes used in this industry. Existing solutions have been ported to the new technical basis and cloud-based offerings have been added progressively. Continuing to develop these ported solutions can further enhance the efficiency of a company, and establish their position in the market.

Energy providers are confronted not only with the expiration of standard maintenance but also with a transforming market and the need to implement new technical options in their own business. This requires IT solutions that provide stable mass processes, but also those that support processes with short innovation cycles and reduced times to bring products to market. This is reflected in SAP's product portfolio. This document has shown that the variety of company positionings require diverse solutions and makes the selection process extremely complex. Providing a complete evaluation of the product portfolio goes beyond the scope of this guideline. We have used an example to show that various SAP solutions are available for the different requirements within a function module and highlighted the need to select the most appropriate one here.

The theory that "SAP IS-U has had its day" is simply not true. SAP IS-U is an R/3 component, which can in future be replaced with a combination of IS-U on the basis of SAP S/4HANA in conjunction with a MaCo Cloud and a customer services solution, such as SAP Cloud for Customer. The system environment required here may at first appear to be more complex, but will harness the benefits of service-oriented architecture. Direct integration of analytical methods in applications in the future will provide an increasingly complex business environment with an overview of both operational processing and company control.

More complex scenarios can be managed further in the on-premise solution. Cloud-based solution options are available for simple energy products in conjunction with non-commodity services. These can be provided quickly at a reduced cost and allow costs to be aligned with the usage duration.

If these new options are to be exploited fully it is vital that IT and expert users work collaboratively to create a suitable concept and modify existing processes. Operating hybrid landscapes requires IT to be restructured. A company-specific roadmap that represents this transformation will provide the necessary security in the transformation process.

As a result of SAP's pledge to provide innovative solutions for the energy sector, development capacity has been allocated to these topics and blueprints and roadmaps in various levels of detail have been developed and communicated. The industry requirements for stability and granularity, which were expressed when IS-U was implemented are simply no longer feasible in an agile environment. Any inconsistencies or contradictions identified by experts, for instance when changing formats, representing target models or creating electronic bills, can only be resolved in a co-innovation process and should not be regarded as the sole responsibility of the software provider.

Inconsistent terminology in SAP solutions is partly the result of acquisitions by SAP, which require time and resources to integrate. This means SAP must develop a better communication strategy to inform customers about these changes.

A significant challenge in transformation to the "new IT world" is enabling users to convert gradually taking account of the demands of operational business. Two business models can be used to identify the IT landscapes required and produce conversion roadmaps. We have shown that the journey towards transformation has already started and the first steps have been initiated. The need to start the project early is due to the complexity involved and the need to respond to market requirements quickly without wasting investment in inconsistent IT landscapes using additional resources.

Licensing and maintenance costs during the implementation process must be considered by each company. Bundling purchases appropriately can help save some costs here.

Implementing innovation requires resources whose use must be in suitable proportion to their benefit. Improved alignments between users and SAP about possible developments could help avoid unnecessary costs in the future. On the other hand, many companies have already created "their SAP" in recent years without seeing any competitive benefits from doing so. Phasing out cost-efficient standard solutions will be a potential source of conflict between expert users and IT. It will also require dialog with SAP to ensure that resources are allocated internally to the appropriate development activities.

Consideration of alternative solutions therefore must be detailed enough to identify both requirements and the possible financial and technical implementation risks.

A critical collaboration between SAP and DSAG based on mutual trust has not only reduced costs when providing solutions to implement EU data protection requirements, but is also the basis for continuous dialog on licensing and specialist issues between SAP and users. Providing a forum for both your questions to SAP and the user community is the mission of our energy providers working group. Please get in touch with us!

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7. Appendix

Database Migration Projects

The requirements for the second migration project have been summarized in Table 3. The requirements for the second migration project have been summarized in Table 4. Both companies use reference model A.

It is possible to perform a database migration to SAP HANA including a Unicode conversion in a short project involving minimum system downtime. In both migration projects, an evaluation of the SAP HANA migration, operation and implications for expert users showed that the quality of work had improved significantly. Shorter runtimes mean tests and quality control measures can be performed more frequently and with less time effort. Shorter or non-existent waiting times for results reduce the number of potential errors. It should be noted here that some self-developed reports may require performance enhancements to leverage the full potential of the SAP HANA database system.

Table 3: Project Data for Migration Project 1

Customer allocation	Roughly 135 000 points of delivery, key date billing
System landscape	Integrated solution: A productive SAP system with three IS-U clients. The SAP Core has been integrated in an IS-U client. No BW, CRM or SAP Portal exists. Converter and SAP Solution Manager as an external solution (ASP).
Project order	Migration of the SAP system landscape to SAP HANA including the unicode migration
Project content overview	• Design hardware and business architecture (internal) • Test migration • Interfaces and code tests • Productive migration • Tests and acceptance
Project period	• 01.01.2016 – 01.06.2016 (Designing the hardware requires a long project period.)
Duration of the go-live/runtimes	4 days /weekend
Work packages	• Data archiving • Unicode • Migration • Test and acceptance • Project management
Specialist tools required?	No (export and import procedure using SAP Inst)
Lessons learned	Migration and operation did not cause any problems. Most additional work was caused by the unicode migration or the operating system switch.

Table 4: Project Data for Migration Project 2

Customer allocation	About 250 000 points of delivery, rolling billing
System landscape	Integrated solution: A productive SAP system with two IS-U clients and several company codes (2-contract model). The SAP Core has been integrated in an IS-U client. SAP Business Information Warehouse, SAP Portal for SAP Business Information Warehouse, SAP UCES Online Center, SAP AVA System and SAP Adobe Document Services have been connected using interfaces. SAP Solution Manager as an external solution (HANA). Use of a two-system landscape for test and productive operation Backup and monitoring performed by central systems.
Project order	Migration of the SAP ERP/IS-U system (test and production) and the SAP Business Information Warehouse System (test and production) to SAP HANA including the unicode migration. Conversion of all other systems to VMware (Windows, SAP ASE database).
Project content overview	• Design hardware and business architecture (internal) • Test migration • Interfaces and code tests • Productive migration • Tests and acceptance
Project period	01.10.2017 – 31.01.2017
Duration of the go-live/runtimes	4 days/weekends, most of this being pure migration time: 5 hours, down time of production system: 24 hours, test and connect third-party systems: 1 day
Work packages	• Preparatory work for migration including data archiving • Code adjustment for Unicode and HANA • Migration • Test and acceptance • Project management
Specialist tools required?	No (export and import procedure using SAP Inst for SAP ERP & IS-U system, SUM DMO procedure for the other systems)
Lessons learned	Migration and operation did not cause any problems. Most additional work was caused by the unicode migration.

Further Reading

The subsequent development of IT infrastructures at energy providers is a topic that will remain relevant in the coming years. Two books have currently published for the German utilities sector, which describe the options for implementing the requirements, solutions and initial planning (Figure 14). The first book “SAP S/4HANA Utilities” focuses on the digital core with the industry component, and describes available functions, transformation methods and more detailed planning aspects. The second book “SAP for Energy Providers" builds on the first book. It shows a more detailed view of solution architecture due to current industry requirements and SAP plans. SaaS market communication solutions, expert solutions and modern solutions related to customer centric processes are examples of this. In combination, both books present requirements, vision, and implementation options.

Figure 8: SAP S/4HANA Utilities and SAP for Energy Providers

These books provide an overview and an introduction to those interested in learning more about the transformation process. DSAG members receive preferential rates from Rheinwerk Verlag if they use the form https://www.rheinwerk-verlag.de/dsag/.

8. Imprint

We expressly point out that the present document cannot anticipate and cover all the regulatory requirements of all DSAG members in all business scenarios. In this respect, the issues and suggestions mentioned must of course remain incomplete. The DSAG and the authors involved cannot accept responsibility for the completeness and suitability for success of the suggestions.

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