



Digitization in Finance and Accounting:

Accounting treatment of ERP and RPA systems using
the example of SAP S4 / HANA at credit institutions

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Nov. 2021

**Rosenheim Papers in
Applied Economics and Business Sciences**

No. 3/2021

Abstract

Technological advancement and digitization have become more and more important in recent years. This is particularly true for credit institutions. The core banking systems used for internal processes are therefore subject to increasing digital change. In many banks, outdated IT systems are still in use, which often lack the basic functionalities that are essential for innovations.

In order to achieve a sufficient functionality of the information technology in the company, core banking systems are implemented, which achieve the mapping of almost all bank-specific processes. In addition, so-called software robots are used to automate standard processes with increasing frequency. Due to the lack of standard products in previous years, there is an abundance of in-house developments. While self-developed systems dominate in the European as well as North and South American markets, earlier in-house developments in the German-speaking countries have mainly been replaced by standardized core banking systems.

The introduction of standard ERP systems poses a major challenge for financial institutions. Not only does the implementation effort in terms of financial resources and working time play an important role, but also the ongoing expenses for maintenance and further development. These investments not only secure and promote the ability to innovate in the age of digitization, but also create an asset in the company. The evaluation for the accounting representation is an increasing challenge due to the steadily increasing complexity of information processing technologies. Questions arise regarding the access assessment, the follow-up assessment and the handling of previous systems. In the following, accounting according to the international accounting standards for the implementation of the ERP system SAP S/4HANA in credit institutions is shown. The procedure and the results are not limited to banks, but can be applied analogously to many industries.

Contents

1 The Problem	3
2 Definition and Classification in the Balance Sheet	4
2.1 ERP Systems	4
2.2 RPA Systems	5
3 Accounting Treatment	6
3.1 SAP S/4HANA ERP System	6
3.1.1 Handling of the core system SAP S/4HANA	6
3.1.2 Handling of subsystems	9
3.1.3 Treatment of the existing predecessor system	9
3.2 RPA	9
3.2.1 Treatment of the core system	9
3.2.2 Treatment of individual software robots	10
4 Summary and Outlook	11
References	12

1 The Problem

The business model of many industries is based almost entirely on information and its efficient processing. Technological advancement and digitization have become more and more important in recent years (see Holtkemper, 2020, pp. 1-2 and Kamhake, 2020, pp. 3-5). This is particularly true for credit institutions. The core banking systems used for internal processes are therefore subject to increasing digital change (see Smolinski, Gerdes, Siejka, & Bodek, 2017, pp. 26-28). In many banks, outdated IT systems are still in use, which often lack the basic functionalities that are essential for innovations (see Alt & Puschmann , 2016, p. VI).

In order to achieve a sufficient functionality of the information technology in the company, core banking systems are implemented, which achieve the mapping of almost all bank-specific processes. In addition, so-called software robots are used to automate standard processes with increasing frequency. Due to the lack of standard products in previous years, there is an abundance of in-house developments. While self-developed systems dominate in the European as well as North and South American markets, earlier in-house developments in the German-speaking countries have mainly been replaced by standardized core banking systems (see Alt & Puschmann , 2016, p. 160).

The introduction of standard ERP systems poses a major challenge for financial institutions. Not only does the implementation effort in terms of financial resources and working time play an important role, but also the ongoing expenses for maintenance and further development. These investments not only secure and promote the ability to innovate in the age of digitization, but also create an asset in the company (see Smith, 2020, pp. 7-9). The evaluation for the accounting representation is an increasing challenge due to the steadily increasing complexity of information processing technologies. Questions arise regarding the access assessment, the follow-up assessment and the handling of previous systems. In the following, accounting according to the international accounting standards for the implementation of the ERP system SAP S/4HANA in credit institutions is shown. The procedure and the results are not limited to banks, but can be applied analogously to many industries.

2 Definition and Classification in the Balance Sheet

2.1 ERP Systems

In the daily business process, the focus is on the needs-based control and administration of incoming and outgoing information, tasks, capital and other company resources. Enterprise resource planning systems provide support by mapping business processes using a uniform database. ERP systems are used in various areas of the company to provide and process information (see Ganesh, Anbuudayasankar, Mohapatra, & Sivakumar, 2014, p. 1).

The S/4HANA ERP system is a system developed by SAP SE that is used in a number of industries due to its versatility. In addition to basic modules such as finance, logistics and HR, it also offers a comprehensive core banking system for the financial industry (see SAP Website at: <https://www.sap.com/industries/banking.html?btp=8625049d-3d49-4e9e-858d-18dca70db90d>)

The basic industry-specific modules are as follows:

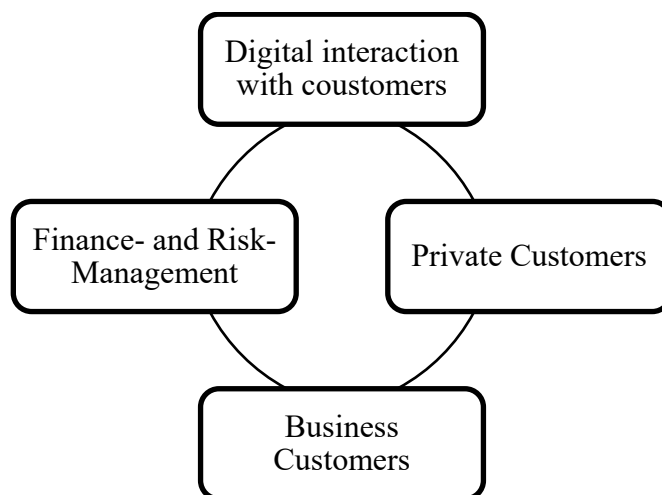


Figure 1: Industry-specific modules of the SAP S/4HANA ERP system for the financial industry (see SAP Website, at: <https://www.sap.com/industries/banking.html?btp=8625049d-3d49-4e9e-858d-18dca70db90d>)

The accounting of an ERP system in accordance with IFRS or IAS is regularly carried out using an asset in accordance with the Conceptual Framework CF.4.3-4. Accordingly, assets are resources that

- are in the company's control due to past events and
- from which a future economic benefit is expected.

It is irrelevant whether it is tangible or intangible. The power of disposal is assumed provided the

company can derive the benefit from it and there is the possibility of preventing third parties from using it. As a rule, sole legal as well as economic ownership of ERP systems is acquired through purchase and use by one's own company over several periods is sought.

In addition, IAS 1.66 requires a distinction between fixed assets and non-current assets. An asset is to be allocated to the fixed assets if it does not meet any criterion of current assets.

Since ERP systems are holistic and long-term software solutions for operational processes and information management in the company, an approach as fixed assets can be assumed. Within the fixed assets there is a breakdown according to property, plant and equipment and intangible assets. ERP systems are software products without physical substance, whose identifiability is given according to IAS 38.12 through the contractual or legal rights resulting from the acquisition of the ERP system.

The ERP system SAP S/4HANA is thus an immaterial asset according to the IFRS definition criteria, the accounting of which the regulations of IAS 38 are to be applied.

2.2 RPA Systems

Robotic Process Automation (RPA) has received more and more attention in the financial industry, especially in recent years, although it is not always clear what exactly an RPA actually is. There are a number of definitions in the literature, but none that are generally applicable. RPA robots are not physical robots, but software solutions that support humans in performing certain activities. They are particularly suitable for the partial or full automation of standard processes. The software can communicate with existing systems, such as an ERP system, and uses the user interface like a human. However, it is not a type of artificial intelligence. An RPA robot can follow predefined processes but does not generate its own knowledge, so it has no learning ability. With this technology, no major changes to existing IT systems are usually necessary and the implementation does not require extensive programming knowledge. Various manufacturers offer applications for developing RPA robots for which training is sufficient for their use (see Smeets, Erhard, & Kausler, 2019, pp. 7-10).

The accounting treatment of RPA software robots and the software for their programming according to IFRS is based on the same aspects, as is the accounting for the aforementioned ERP systems. It is software with no physical substance, from which the company expects future benefits over several periods and over which it has sole power. The software for programming can be identified by the existing contractual rights and does not represent a monetary asset. The individual software robots are not identified by contractual or statutory rights, but by their

separability and the possibility of separate sale. This is given because the individual programs are not inextricably linked to other non-identifiable assets. This means that the RPA robots and the software for their programming also fall under the accounting guidelines of IAS 38 for intangible assets.

3 Accounting Treatment

3.1 SAP S/4HANA ERP System

3.1.1 Handling of the core system SAP S/4HANA

With the introduction of the SAP S/4HANA ERP system, banks are hoping for not only increased performance but also expanded usage options in the field of process digitization. In addition, support from SAP SE for currently used ERP systems will no longer apply in the coming years. The planning for the complete introduction of SAP S/4HANA is exemplified in a multi-level plan as follows:

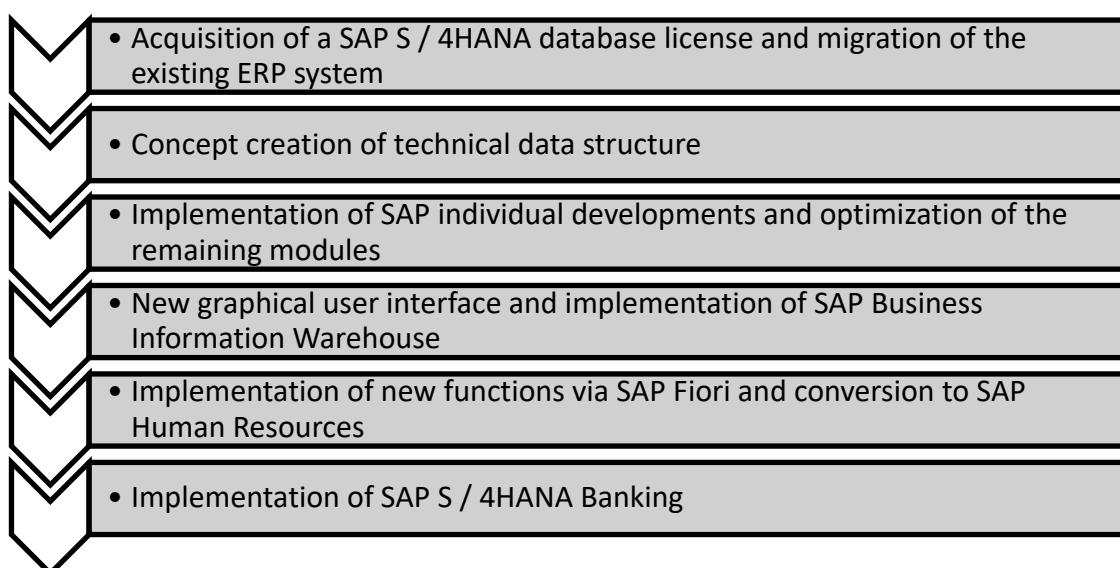


Figure 2: Multi-level plan for SAP S/4HANA implementation

For the introduction and operation of SAP S/4HANA, various customizing expenses are necessary in the area of the individual modules. These are essential for the economic use of the ERP system and for ensuring maintenance by SAP SE. Once the operational measures have been completed, all function modules are inextricably linked to the SAP S/4HANA platform. The operational readiness status begins as soon as the last module has been integrated.

As already described, the accounting approach of the ERP system SAP S/4HANA takes place as an intangible asset according to IAS 38. The price paid by the buyer for the license reflects the expected benefit from the acquisition. In addition, this is the basis for a reliable assessment. In order to determine the acquisition costs, the purchase price as well as all directly attributable

costs are set up until the desired operational readiness is achieved. In particular, the customizing expenses for implementing the individual modules on the SAP S/4HANA database represent a significant part of the implementation effort.

The subsequent evaluation of the ERP system takes place in accordance with IAS 38.74 according to the acquisition cost model. The use of the revaluation model is not permitted, as the substantial customization of the software means that no valid valuation can be made by an active market.

When estimating the useful life, it is assumed that use is limited in time. The license acquired does not provide for any limitation, but limited use can be assumed due to technological change. The ERP system used so far can provide an indication of the useful life. A service life similar to that of the predecessor systems, which were often used for many years, does not appear realistic given the current technological developments to be expected. The development cycles of ERP systems on the part of SAP SE have also been continuously shortened in recent years. It can e.g. the following development can be assumed.

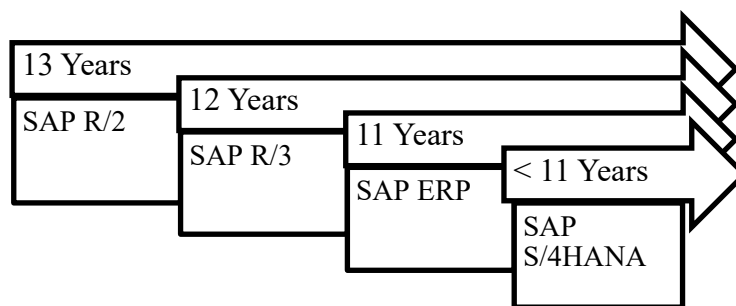


Figure 3: Usage times of SAP SE ERP systems

In the example, the useful life is conservatively estimated at a period of 8 years. It can be assumed that this will be shortened or lengthened under certain conditions. Functional expansions that meet the criteria for subsequent acquisition costs in accordance with IAS 38 could lead to a reassessment of the amortization period and possibly extend it. The depreciation is scheduled over the specified useful life and begins as soon as the operational status specified by management has been reached. This occurs when the last module has been integrated and customizing has been completed. Since there are no typical product indicators for wear and tear in the ERP system, the straight-line depreciation method is used. The residual value is set at zero, as there is no purchase obligation on the part of a third party and there is no known active market for such individualized software products. The chosen amortization period and method must be checked annually and adjusted if necessary. If there are any additional indicators of impairment,

an impairment test must be carried out and, if necessary, the book value must be adjusted by means of an unscheduled depreciation.

The asset develops, for example, in the balance sheet over the term of the project as follows:

Stage	Process	Balance Sheet Impact
1	Installation of the database	Activation of the database license as an intangible asset under construction. This serves the permanent business operation of SAP S/4HANA.
2	Relocation of the applications from the previous ERP system to the SAP S/4HANA database.	The existing applications that were used on the previous ERP system can continue to be operated after customizing. The accounting treatment as individual assets is retained for the time being.
3a	Preparatory measures and readiness check	The necessary preparatory measures are carried out by SAP SE. Necessary expenses are also capitalized as intangible assets under construction.
3b	Customizing of the existing modules of the predecessor ERP system and inseparable connection with the SAP S/4HANA platform	The software object in the form of the database is successively connected to the existing legacy applications of the predecessor ERP system. The individual modules are checked for possible impairments and then transferred to the new asset, as these are now inextricably linked to the SAP S/4HANA database. Business use and subsequent valuation begin.
4	Project completion	Re-examination of the accounting treatment.

Table 1: Exemplary balance sheet development of SAP S/4HANA

3.1.2 Handling of subsystems

Any existing subsystems that are not or will not be an original part of the new ERP system must also be subjected to customizing processes. These can be software products that have not been developed by SAP SE and are linked via interfaces. The connection to the new ERP system not only enables further use, but also often leads to significant functional improvements and performance gains. The banks sometimes expect a significant increase in benefits and see the possibility of capitalizing the customizing expenses as subsequent acquisition costs. The reliable assessment of the costs to be capitalized can be done via the project management by creating a separate project cost center. In addition, the useful life is expected to be extended by a further eight years, based on that of the ERP system. The reason for this is the technological adaptation of the existing subsystems for further use under SAP S/4HANA.

3.1.3 Treatment of the existing predecessor system

The previous system still in use will now be successively replaced. This ERP system is sometimes not accounted for as a single intangible asset. The license and the associated modules were not seen as inextricably linked and accounting was often carried out separately. Some modules, which already existed in the previous system, are modified for further use as a result of extensive customizing and are inseparably linked with the new ERP system. They are accounted for as part of the SAP S/4HANA asset. The activated license of the replaced ERP system is no longer used for business purposes and the sale of the license also appears absurd due to the expiring support of SAP SE. The asset therefore no longer generates any future use and must be fully written off after it has been replaced. The disposal in the amount of the book value is to be shown in the income statement.

3.2 RPA

3.2.1 Treatment of the core system

The core system for programming the individual RPA robots is a licensed software solution that enables internal employees to design and implement robots for selected processes. The assessment of the software as an intangible asset in accordance with IAS 38 has already been made above. The fact that the software was acquired from an external provider means that the necessary criteria for the inflow of benefits and a reliable assessment can be regarded as fulfilled. Both requirements are reflected in the price set on the market for acquiring the license. The acquisition costs that can be capitalized must be determined for the acquisition valuation. These amount to the purchase price and the relatively low implementation costs. Training costs for users of the software must not be taken into account.

For the subsequent valuation, a scheduled depreciation is chosen according to the acquisition cost model. An application of the revaluation model appears to be possible in principle, since it is a standard software product for which a fair value could be determined. Nevertheless, the market for the resale of such products is difficult to assess, since contractual restrictions regularly prevent resale. The use of the software license is often subject to a time limit that is contractually stipulated. After purchase, the license can be used, for example, for three years to program robots. The amortization will therefore take place over a useful life of three years. The straight-line depreciation method is chosen as the amortization method, as there are no factors for consumption-based wear and tear.

3.2.2 Treatment of individual software robots

In addition to the license just discussed, there is the question of how the software robots are treated in the balance sheet. These are not a separate acquisition, but rather internally generated intangible assets. The assumption that the acquisition criteria according to IAS 38 will be met cannot be made here.

The future economic benefit of the robots consists in the time and cost savings through the acceleration of process sequences and the reduction in the frequency of errors through standardization. The probability of occurrence of the benefit can e.g. be ensured by an evaluation tool for the determination and assessment of processes suitable for automation. A reliable access assessment is given by the project cost management, provided that each RPA robot is treated as a separate project. This means that all expenses incurred are recorded from the start of development to economic usability. The beginning of the development phase is defined as the end of the evaluation and identification of the specific process. Both internal and external production costs can be assigned exactly to the respective project cost center and thus to each robot. For self-created intangible assets, there are also further activation criteria. These criteria must be fully checked and documented.

- a) The technical feasibility is checked on the basis of a cost and time estimate.
- b) The intention of completion is determined by a project plan with a budget application.
- c) The ability to use the RPA robot is demonstrated by analyzing the process to be automated.
- d) The future economic benefit is calculated in monetary terms through time savings after the project has been implemented.
- e) The availability of resources is ensured by an estimate of the costs and the allocation of a project team and a budget based on this.
- f) The reliable determination of expenses is carried out by the project management.

Due to the high degree of customization of the individual robots, the acquisition cost model is used for the subsequent evaluation, as there is no reliable evaluation according to the re-evaluation model.

The useful life of the individual robots must be estimated. Use is not affected by the time limit of the programming software, but a relatively short lifespan - for example 3 years - is assumed. The reason for this is the restricted function on special processes. From a historical perspective, and as expected, these show a constant change in the future. Adjustments to the software to maintain usability in the event of process changes are possible, but from a certain level of complexity they no longer make economic sense. Such process changes cannot be forecast for the future as planned. Therefore, a valid estimate of future consumption-related depreciation is not possible and the straight-line depreciation makes sense as an amortization method.

4 Summary and Outlook

Digitization is already closely interwoven with the financial sector and will continue to be a defining factor for the future of credit institutions in the years to come. The trigger as well as the consequence of this development is a constant increase in the performance of information technology systems to accelerate internal and external processes. Digitization thus continues to offer potential for increasing efficiency with increasing complexity of the systems used. Current developments suggest that the speed and complexity of changes will at least be maintained, if not increased.

Due to the rapid technological progress, the access and follow-up evaluation of software products will change. For example, the point in time of economic usability will be increasingly difficult to determine due to the ever more extensive requirements for these cross-departmental systems. This can also lead to difficulties in delimiting acquisition and production costs and maintenance costs. In the area of subsequent valuation, the technological change can increasingly result in unscheduled depreciation and a shortening of useful lives. The development time for new ERP systems is continuously decreasing. Since this shortening is usually not linear, it is increasingly difficult to estimate a valid service life, especially in the area of ERP systems. At the same time, if a straight-line depreciation method is assumed, the expenses from amortization increase due to reduced useful lives. Due to the sometimes high investment volume, this can have a not inconsiderable impact on the company's results. In summary, it can be assumed that the accounting treatment of complex software products will be subject to increasing uncertainty (see Smith 2020, pp. 11-13).

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