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Prof. Dr. Werner Müller

1494 - 2019 525 Jahre doppelte Buchführung / 525 years of double-entry bookkeeping
525 años de contabilidad de doble entrada / 525 ans d'analyse comptable
525 ans de comptabilité en partie double



A research project in the Caribbean

Accounting 3.0

from 1494 until today

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Foreword

At the beginning of this book the following joke from the year 1969 should be quoted: The first American astronauts land on the moon. As they disembark from the lunar module, a group of older men approach them. Astonished, the astronauts ask who they are. One replies: "We are German professors. We've been living behind the moon for a long time! "Living behind the moon is a metaphor for not having a clue about reality. You cannot see the earth behind the moon and you cannot know what's happening there.

The typical career of a professor leads through the wards assistant, doctoral candidate, research assistant and lecturer far past the professional practice. Highly respected professors who publish recognized standard works as textbooks are often referred to as popes of individual disciplines and subject areas. This means infallibility. However, their careers can make them as outlandish as the popes in the Vatican and in their standard works and textbooks pray down what they once learned during their studies. As reality changes, these respected professors also live behind the moon.

The bookkeeping, which is still treated in the textbooks, is at least 650 years old - it was first described in a book in 1494. During this time, the world has changed. The changes of the last 40 years in the course of digitization have passed many textbooks. The popes, who live behind the moon, have not really analyzed and built them into their worldview. Many changes were slow, and the gap between theory and practice has widened.

It is deliberately omitted citations from other sources, with the exception of their own publications. It will be presented here against the background of own observations a concept. But then one should not ask whether just criticized popes have made the same observations. The popes will criticize that this approach is not scientific work. But the Reformation in the church has also begun with simple expressions of the heretics. At that time, not only were their books burned. The author does not want to lead this discussion. He likes to join the line of heretics, and he does not mind if this text is seen as expression.

Motto:

"Who can not see well should not drive a car! Who has no accounting should not lead a company! Both are driving the cart against the wall! "

1. History of accounting

Probably the invention of the characters was a step towards the development of an accountancy. People wanted to have an overview of their supplies.

The bookkeeping is therefore very old, even if this chapter does not go back to the early history of mankind.

1.1. Paccioli

Italian merchants developed the double-entry bookkeeping system in the 14th century. It uses Roman numerals instead of Roman numerals and also records every transaction twice, not just once-once on the debit side and once on the credit side. Luca Pacioli described this method in 1494 in a printed book as a Venetian bookkeeping - and spread it as a new standard from Italy throughout Europe. From the year 1511 a balance sheet for these procedures from Germany is handed down for the first time - from the accountant of the trading house Fugger, Matthäus Schwarz. During the 16th century, double bookkeeping spread throughout the whole of Europe during the period of mercantilism, and later throughout the world during the period of colonialism. With it also large enterprises could be controlled effectively.

At the same time, the Roman numerals were replaced by the Arabic numerals in the decimal system. Because the double-entry bookkeeping with Roman numerals would not have worked and because without the bookkeeping the use of Arabic numbers would not have been so necessary, both innovations have mutually reinforced each other.

Paccioli was a friend of Leonardo da Vinci and the method he described was brilliant as many Leonardo's ideas. It took into account the limited capacity of the human brain and was used for about 490 years without significant changes. But good methods will one day be replaced by better ones!

1.2. Industrialization

Industrialization demanded an extension of the method. In mercantilism, large trading houses with double-entry bookkeeping managed their businesses. The goods were transported over larger distances and remained physically unchanged. Further processing took over smaller entrepreneurs. The double-entry bookkeeping was thus geared to the trade.

With industrialization and the emergence of larger factories, attention has shifted to adding value through a change in purchased goods and the use of labour and machinery. The bookkeeping was supplemented by a cost accounting. The point here is to trace and evaluate the value added from the input (= cost element) to the output (= cost unit) via the processes running in the company (in cost centers).

There were attempts to map cost accounting to accounts and thus to integrate them into the double-entry bookkeeping system. These attempts were again rejected as too laborious; or they could never prevail in the companies. However, parts of these approaches have been included in the textbooks. Instead, the cost accounting was understood as a separate system and developed tabular as an output of accounting. This led to a strict separation between external and internal accounting. It was only in the course of digitization that both systems became more closely linked again.

1.3. Regulation

In the course of modernity and the industrial age, accounting is becoming the focus of legislation and increasingly regulated. In 1794 this includes the introduction of the general accounting requirement for companies with the General Prussian Land Law or in the French Code de Commerce of 1807, but also the emergence of the Prussian Commercial Code of 1861, converted into the German Commercial Code in 1897 and still valid in its basics.

With the decree of the German and Prussian Minister of Economic Affairs and the German Commissioner for Pricing v. 11.11.37 - II 19263/37 VI 9991/37 concerning guidelines for the organization of bookkeeping (as part of a single accounting system) in Ministerial Journal of Economy 1937 p. 239 and the decree of the German and Prussian Minister of Economic Affairs and the Reich Commissioner for Pricing v. 16.1.39 - S 5151/39 VII - 50 - 49/39 general principles of cost accounting, external and internal accounting in Germany was heavily regulated. Although the regulations expired in 1953, they have greatly influenced companies in designing their accounting systems. Initially, business organizations in their respective industries took on the task of developing recommendations for unified charts of accounts based on the Nazi revenue account framework, which has implemented the Process Allocation Principle. It was not until 1970 that the Federation of German Industries developed the Industrial Accounts Framework (IKR) with the Annual-Accounts-Classification-Principle. In the 1980s, the tax consultancy company DATEV issued standard accounts and superseded the recommendations of the

associations. But they are more oriented to tax specifics and less to economically useful evaluations. The DATEV SKR03 follows the Process-Structure-Principle and SKR04 the Annual-Accounts-Classification-Principle.

After 1953, only the regulations of the Commercial Code (HGB) and for corporations additionally the Law on Joint-Stock Companies (AktG) were obligatory, to which the Law on Companies with Limited Liability (GmbHG) referred. As part of the 4th, 7th and 8th corporate law directives of the EC into German law, the rules of the AktG were adopted in 1985 in the 3rd book of the HGB and reorganized the accounting. As part of the globalization of the capital markets from about the second half of the 1990s, international regulations gained in importance, which were significantly influenced by the USA.

In 2003, the Council of the European Union approved a regulation requiring the application of the International Accounting Standards (IAS) (later: International Financial Reporting Standards - IFRS) as of 2005 for consolidated financial statements of publicly traded companies. Within the framework of this development, Germany is breaking away from the accounting principles previously codified in HGB and is primarily addressing Anglo-American accounting rules.

The HGB as well as the IFRS regulate the contents of the evaluations to be prepared and if necessary to be published and do not prescribe any concrete accounting technique. The double entry bookkeeping can therefore also be replaced by another technique if it meets the quality requirements.

1.4. Digitalization

For several hundred years accounting has been based on the manual transfer of amounts on paper, as it has been the case for some 130 years for Cost Accounting. Only since about 30-40 years the companies are using newer, computer-assisted methods, which have not yet penetrated into the textbooks. In this case, the double-entry bookkeeping according to Paccioli was largely reproduced electronically. Only individual work steps were replaced and additional evaluations were created. On this basis, links and data transfers with non-accounting computer applications developed. For about 15 years, there has been a tendency to merge these applications and extend the focus on representing the past into a database for the future.

However, these techniques are treated as a trade secret of software providers. It is now time, as Pacioli 525 years ago with the Venetian Accounting to describe today's possibilities as a stringent system and thus replace the method of 1494 in the textbooks. At the same time, it can also be opened up to small companies who do not want to afford the expensive software and who lack the specialist staff for their service. If a globally disseminated method is to be replaced, it must not only be usable in industrialized countries.

In the 21st century, there is a growing realization that organizational and technical knowledge is a fourth factor of production. This factor can also be increased easily. As in the nineteenth century manpower was replaced by machinery, today the use of capital and labour can be reduced with a smarter organization and it can also conserve natural resources. For this, the processes

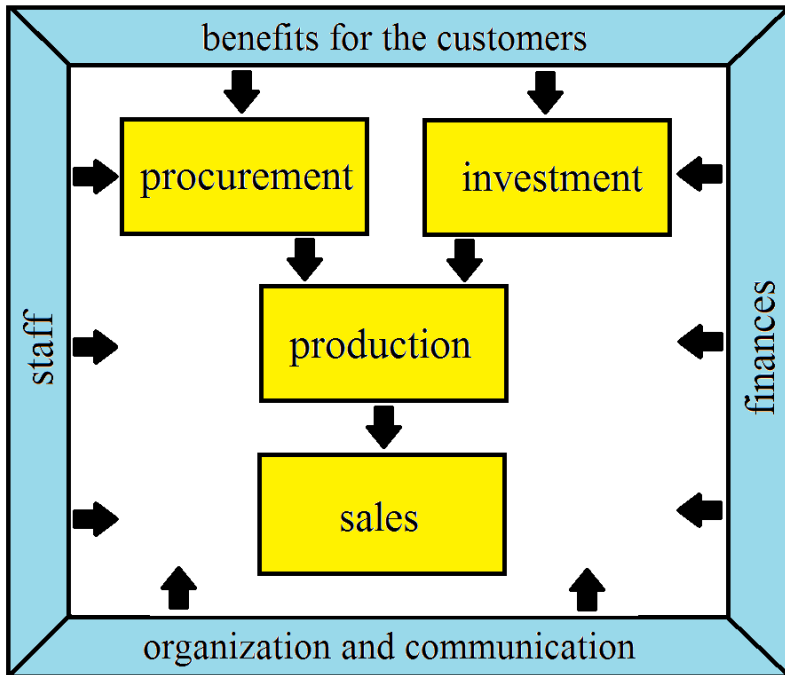
and sub-processes must first be analysed precisely and later simplified. The identification of the individual processes and sub-processes is necessary in order to constantly assess and improve them. All conscious processes are planned more or less intensively and carried out according to this plan.

1.5. Value Added and Market

You can compare the companies with vehicles. There are trucks, tractors, vans, cars and motorcycles. There are also mobile machines in which locomotion is only a secondary purpose. On the other hand, one can distinguish between production companies, trade and services. All vehicles have wheels, a chassis, an engine, a transmission and a steering. All businesses buy up inputs, create value and sell their services. They combine capital goods, consumables and labor. As with the performance of a vehicle, there are major differences in operational performance, but also many similarities.

The economic process is based on the production of a benefit for the customers of the company, which represents the operational purpose. The company sells this benefit if the proceeds of the sale are greater than the cost of its production. Customers buy it if they value the benefit higher than the price the company demands. The production of benefits is limited by the capacities of the companies. The customers have only a limited income available. They must prioritize and first buy the essential goods, then look for the maximum difference between utility and price. The companies primarily produce the goods and services with the greatest difference between price and cost.

Fig. 1: Value creation process



Source: <https://mueller-consulting.jimdo.com/research/background/>

In the creation of value in business, a combination of the production factors capital and labour takes place. Specifically, the use of personnel and finances is coordinated. When using capital, a distinction is made between potential factors and repeating factors. Potential factors arise from investments that determine the capacity of the operation. Repetitive factors are constantly consumed in the company's added value and replaced again. The personnel deployment is predominantly attributable to the potential factors. The staff must first be recruited and often also trained or trained. The potential also

includes the professional experience of the employees. To a lesser extent, however, the workforce is also a potential factor if the employees work overtime and are paid extra for it.

In addition to the potential and repetitive factors, the dispositive factor can also be identified, ie the ability to optimally organize and coordinate the processes. He creates a positive gap between the selling prices and the unit costs and in the end generates the profits. The dispositive factor is mainly effective in selling the products. In a broader sense, this also includes communication with the environment, with which a positive image of the company is built and maintained, which is a long-term prerequisite for the sale of one's own products.

1.6. Navigation System of Business Management

The job of accounting is to support business management with data. It is similar to the cockpit of a car: the driver steers, but the instruments provide him with the data. There is a speedometer, tachometer, fuel gauge and many indicator lights. This includes the cables that report the data from the different parts of the vehicle to the cockpit. The speedometer shows the current speed and the driver decides whether he wants to maintain the speed, faster or slower drive. A big coach needs more ads than a small moped. But the moped driver must get the most important information. The target group of this project are the moped riders, not the large corporations, but the small business owners!

As a data supplier and navigation system, accounting is of central importance in today's economy. If the driver cannot see anything, then an accident is very

likely. Without an overview of the economic situation and development, a company cannot be run safely.

Fig. 2: Navigation system

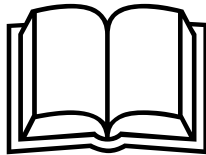


Source: own representation

The navigation system must be oriented to the needs of the specific company. Much can be taken from the experiences of others. These suggestions and templates will always have to be adjusted. There is less need for adjustment when there are many templates for different industries, legal forms and company sizes from which to choose. Once this patterning solution has come a long way, one day, as in clothing, almost everyone can find clothes that are comfortable with existing clothing, and at the same time select clothing from shapes and colours which the buyer looks good too.

2. Accounting 1.0

In this chapter, the bookkeeping 1.0 should be described as a relic from a past time. It is not the claim that the reader mastered this technique afterwards, in addition it is partly outdated.



2.1. System

The bookkeeping according to the description of the year 1494 represents mainly the production factor capital; the factor labor is only taken into account with the personnel costs. It is differentiated according to the origin of the capital. Equity is attributable to the entrepreneur or the shareholders. It may consist of deposits or retained earnings. Also the current profit or loss belongs to the equity. Debt capital belongs to persons who are not among the co-entrepreneurs. They are entitled to repayment and often receive interest.

The capital is used in the company for potential factors and repeating factors. According to this classification, the use of capital is divided into fixed assets and current assets. The sums of wealth (use) and capital (origin) are equal in amount. They are contrasted in a balance (balance = equilibrium), with the left side (called assets) representing the assets and the right side (called liabilities) the capital.

The balance sheet is then broken down into accounts, where entries and exits are recorded.

Fig. 3: Accounts and balance sheet

balance		sheet	
fixed ass.	500	equity	300
curr. Ass.	500	liabilit.	700
	1.000		1.000

fixed assets				equity			
beg.	450	disposals	50	disposals	50	beg. bal.	250
add.	100	end. bal.	500	end. bal.	300	addit.	100
	550		550		350		350

current assets				liabilit.			
beg.	450	disposals	9.450	disposals	3.000	beg. bal.	650
add.	9.500	end. bal.	500	end. bal.	700	addit.	3.050
	9.950		9.950		3.700		3.700

Source: own representation

The final balance transferred to the balance sheet was called the "balance".

The accounts can be broken down into subaccounts again. For clarity, it is necessary to combine several accounts into one balance sheet item. Then, in the 1494 system, each balance sheet item would have to be treated like an account and each account as a subaccount.

The balance sheet is set up at a time. The operational activity takes place however in periods. This is especially true for the gain or loss resulting from the difference in income and expense of a period. It is part of the equity. To record this size in the balance sheet, the Accounting 1.0 of 1494 creates a profit and loss account as a sub-account of equity. This is subdivided into sub-sub-accounts, in which income and expenses are recognized in different ways.

For the accounts, a distinction is not made between assets and liabilities, but between debit (left) and credit (right). The accounts themselves are divided into balance sheet accounts that are included in the balance sheet and income

statement accounts. Stock accounts are divided into asset accounts and liability accounts for the capital items. Success accounts are separated into expense and income accounts. For asset accounts, additions to assets are posted in debits and outflows in credit. In the case of the liability accounts, conversely, the additions to the capital in the credit and the outflows in the debit are recorded. Income accounts include the income and the expected income corrections. In the case of expense accounts, the expense is posted to the debit and expense adjustments in credit.

Each business transaction has two sides. The purchase of an item (payment later) increases the assets (debit) and at the same time the debts (credit) increase. If this item is paid later, the debt (debit) and at the same time the money stock (credit) decreases. The balance of the balance sheet is maintained if each transaction is recorded on both sides and the sums of debits and credits are always identical.

In addition to double entry and deferred accounting, each business transaction in the 1494 system is recorded twice, in chronological order in journals and factually in accounts. A further explanation of the term "double entry accounting" is the possibility to determine the profit in two ways, namely by the so-called business asset comparison on the comparison of the equity at the beginning and end of the period, which is determined from the difference of assets and debts ; and the income statement based on the income and expense accounts.

All bookings are based on receipts. Here, a distinction must be made between

internal and external documents. Another distinction is whether they depict external events or internal events. External documents, which are thus created by non-company members, have the higher evidential value. By their very nature, however, they can almost exclusively relate to events with external effects, in which case the company does business in the procurement or sales market. However, documents about internal processes cannot normally be made by external companies. An exception could be e.g. be a notarised deed on a change in the ownership structure. Self-documents with external effect are e.g. Invoice copies of services rendered. With self-prepared-documents about internal processes, there can be gaps. This group includes e.g. Logs from production about the type and number of finished products. But there are also processes in which there is no awareness of the balance sheet relevance.

In the bookings, reference must be made to the respective document by means of a document number. With these references, the background of the booking can be clarified quickly if necessary.

2.2. Journals

The chronological recording of business transactions in journals takes place using posting records, that is, the data required for further processing. In the textbooks, this is reduced to the statement of accounts and amounts. In practice, however, also in the system of 1494 document type, document no. and document date as well as a short text. For the accounts, a distinction is made between the accounts with debit and credit postings. A short form of the

booking record is then displayed "per [debit-account] to [credit-account]", whereby there may be several accounts on both sides. One speaks also of "debit" [debit account] and "credit" [have-account]. After registering an operation in the journal, the posting record was then transferred to the accounts that were kept as index cards. In the early days, single sheets were used, which were bound to a book after the end of the year and the preparation of the balance sheet.

In the 20th century, the strict chronology was softened and different journals were kept for frequent transactions such as sales, purchases of goods or payments. This made it possible to record the transactions only on the ledger accounts and to transfer only the totals of the journal page to the nominal accounts and to refer to this page. The payment date was later noted in a free column in the journal to get an overview of outstanding items.

An extension of this technique is the "American Journal". Here, all business incidents were only presented in the journals and mapped to different columns that replaced the accounts. Debits and credits were often replaced by plus and minus, which halved the required number of columns (or avoided doubling). This required a manageable number of accounts or columns. Business with customers and suppliers was recorded together in one column. The open items were kept in an orderly document storage, in which the unpaid and afterwards the paid invoices were filed in front of a cover sheet. The filing was arranged alphabetically according to the names of the customers or suppliers. On personal accounts could be waived so.

The American Journal was normally started monthly with new leaves. The figures of the individual months were transferred to an annual overview. From these annual overviews it was possible to quickly create balance sheets and profit and loss statements for individual months or the year in which they occurred. They were not very profound, though. Depreciation and other valuation issues also had to be taken into account in secondary calculations.

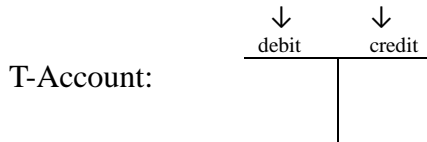
2.3. Nominal Accounts and Charts of Accounts

In the system of 1494, accounts are the settlement unit for the itemized business transactions. Their purpose was to be completed on the balance sheet, G.u.V account or other accounts. After that, they were zeroed. In them one could read only the development of the amounts. In the textbooks the accounts are presented in a simplistic model as a "T-Account"; a large part of the account data is omitted.

Fig. 4: Nominal Account and T-Account

Date	Receipt Type	No.	Journal- page	booking text	Amount Debit	Amount Credit	counter- account

simplistic model:



(Source: own representation)

This simplification cannot be criticized because the additional data are of no importance for the presentation of the accounting system. The task of a model, to explain simplistic, is thus fulfilled with the T-account.

Because of the large number of accounts, it is necessary to uniquely identify the accounts with an account number and to structure them meaningfully in charts of accounts. There are different principles and suggestions for this. 1937 was in the decree of the Imperial and Prussian Minister of Economic Affairs and the Imperial Commissioner for Pricing v. 11.11.37 - II 19263/37 VI 9991/37 concerning the guidelines for the organization of accounting (as part of a single accounting system) a chart of accounts is mandatory. It followed the so-called process structure principle and had the following account classes for the first position of the account numbers:

Fig. 5: Account classes of the 1937 remittance account

0	Dormant accounts or investment and capital accounts
1	financial accounts
2	delineation cones
3	accounts of raw materials and supplies or goods purchase accounts
4	accounts of cost elements
5	clearing accounts when using a Overhead allocation sheet
6	accounts for cost accounting in conjunction with the free class 5
7	accounts of semi-finished and finished products
8	Revenue Accounts
9	closing accounts

(Source: own representation)

Although the accounting framework has not been mandatory since 1953, the process structure principle has remained in many companies to this day. In addition, the Annual-Accounts-Classification-Principle is relevant, which numbers the accounts according to their arrangement in the items of the annual financial statements.

2.4. closing accounts

The 1494 system, in principle, does not allow for monthly or quarterly financial statements. Since the accounts are closed via the income statement or the balance sheet, they cannot be rebooked afterwards, because the accounts had to be closed before. Both analyses were presented in the form of an account, whereby all balance sheet accounts with debit surplus (balance in credit) had to be shown on the assets side and those with credit surplus (balance in debit) in on the liabilities side. Success accounts with credit overhang (balance in debit) were shown on the right side of the income page and those with debit overhang (balance in credit) on the expense side. Adjustments with balances on the "wrong page" had to be completed beforehand via another account.

It could also be created by this system, no trial-proof conclusion. If you find errors after installation, a correction is complicated. The closure of the failed account must be cancelled (= repeat faulty posting with reverse debit-credit assignment and thereby cancel). Then the correct value has to be determined.

Because a mistake in the double-entry accounting results in at least one more error in the contra account, the same correction must be made there as well. However, there can also be further consequential errors with multiple correction requirements. For many detected errors with their follow-up errors, the entire closing postings are very confusing.

To limit such difficulties, the main financial statements were developed. Here all accounts were listed before their closing with the sum of debit and credit entries and the resulting debit or credit overhang. The debit / credit overhang has been allocated to different columns of assets, liabilities, income or expense. From this, preliminary balance sheet and P/L-drafts were prepared and then examined for conclusiveness and possible errors. In the case of errors, correction columns were added in which the necessary corrections with plus and minus were entered. After that new designs could be created. The goal was to recognize all forgotten bookings and discover any errors before closing the accounts. With a quarterly summary of financial statements, unofficial quarterly financial statements could also be prepared.

In addition, the traditional US-American balance sheets should be mentioned, which did not represent an account, but a tabular equity calculation in staggered form. They followed the basic pattern:

Fig. 6: Traditional balance sheet structure in the USA before 1934

money holdings
+ Customer demands
+ Supplies
– Supplier liabilities
= Working capital
+ Other assets
– Other debts
= Equity

(Source: own illustration)

Here there was no transfer of accounts to the balance sheets. The bookkeeping was rather understood as a database, from which the evaluations were created. Whether this database consisted of accounts or American journals was irrelevant.

2.5. Sub-ledgers

Subsequent accounting is understood as systems with which individual accounts or account areas are subdivided into subaccounts or recorded and presented using other methods.

2.5.1. personal accounts

In the case of personal accounts, separate accounts are kept for customer receivables and supplier liabilities for each customer (called debtors) or suppliers (called creditors) showing the invoices and payments relating to these

persons. This then results in the open items that still need to be paid. Done items were cleared on the person accounts, i.e. mutually compensating invoices, credits and payments were marked with a number. Postings with no numbers behind them were open items.

In the 1494 system, the personal accounts were intended as sub-accounts of the customer receivables and supplier liabilities, which should then be completed through this G / L (General Ledger) account. The G / L accounts then show a balance list of debtors or creditors. With each journal column for customer receivables and supplier liabilities, the respective sums per journal sheet were also posted to the G / L accounts, and the customer and vendor accounts became subordinate bookkeeping. Now balances-lists of the debtors or accounts payable were made at regular intervals, in order to check the agreement of the sub-ledger accounting with the general ledger accounts, and also to get an overview of the open items.

When opening a personal account after a financial statement, all previously open items in the opening bookings had to be recounted separately.

2.5.2. foreign currencies

Particularly in the small states of Italy and Germany, a large number of different currencies coexisted. In Germany, a common German parallel currency was created only with the introduction of the Talers in the German customs union in the year 1857 (a Taler = 30 Groschen = 360 Pfennige), which

was replaced in 1871 by the Mark and the decimal system ($1/3$ Taler = 1 Mark = 100 Pfennig). South German states had mostly the Gulden, the Hanseatic cities the mark and in Prussia the Taler (this name was also adopted by the USA for its currency, in the Low German pronunciation "Dolar", the second L was due to the harsh pronunciation of the American English added), but there were also different exchange rates between currencies with the same name. Business in foreign currencies was, therefore, until the late 19th century, an everyday business of merchants.

The accounting was conducted in the domestic currency. In foreign currency accounts receivables, liabilities and cash balances were juxtaposed in both currencies. The regularly fixed exchange rate was noted next to the account name. Totals and balances were determined for both columns, but only the balance of the domestic currency was included in the balance sheet. At the end of the year, however, the foreign currency amounts were also carried forward.

2.5.3. Inventory Accounting

The logic of foreign currencies could also be transferred to accounts, in which in addition to the monetary units and units of measure should be kept. The units of measure were treated as one currency. However, since prices can always be different here, the purchasing department had to enter quantity and monetary units separately instead of multiplying the units of measure by the price. On the other hand, an estimated average price had to be assumed for consumption or sales. A weighted average pursuant to section 240 (4) HGB or a

consumption-follow-up procedure according to section 256 HGB are only suitable for the evaluation in financial statements, because only the end of the period must wait here. To estimate whether an estimate is still up-to-date, the unit price of access must appear from the accountancy account.

Inventory accounting records every important material type and every commodity on its own subaccount. The sums of the amounts for the inflows and outflows can then also be transferred to collective accounts in General Ledger Accounting. It is not recommended to conclude inventory accounting using G / L accounts. Clearing accounts were necessary for the offsetting entries in the transfer.

Using the logic of warehouse accounting accounts, it was possible to create consumption statistics for expense accounts by adding the cost and the consumption amount. Theoretically, one could also have a third column for sizes that caused the consumption. For example, fuel consumption of a truck could cost, liters, and km driven in three columns. However, the system of 1494 did not develop this train of thought, even though the pronounced inventory accounting did not come into being until industrialization.

2.5.4. Fixed-Assets-Accounting

Fixed-Assets-Accounting is a system in addition to bookkeeping in tabular form, not subaccounts. This sub-accounting has emerged only in or after industrialization, when the better transparency of investments, which

constituted the essential operating base of the industry, became a major concern. In addition to the current values, the original acquisition or production costs should also be shown. A large gap between the two values indicates a need for reinvestment soon. Pursuant to Section 284 (3) HGB, the depreciations, additions, disposals, reclassifications and write-ups of the financial year and depreciation are based on total acquisition and production costs at the beginning and end of the financial year, which were carried out during the financial year. Depreciation and amortization of depreciation in its entirety in connection with additions, disposals and transfers during the year in the notes.

For this purpose, the objects of the fixed assets, the acquisition costs of which exceed a minimum limit, were recorded on an index card and the required information was entered there. All index cards were transferred to the list with the values for the fiscal year in a list, which represented all objects among each other. Subtotals and totals were created for the objects of individual G / L accounts and then the balance sheet items.

This investment grid was then condensed to a statement of changes, which only shows the condensed figures of the respective balance sheet item. This schedule of assets is covered by Section 284 (3) HGB.

The carrying amount of the fixed assets is the difference between the total acquisition and production costs and the total depreciation at the end of the financial year. These book values were reconciled between asset lending and

G / L accounts. A presentation of this comprehensive data on sub-accounts would be very expensive.

2.5.5. Payroll

Payroll accounting is also a method outside accounting on accounts. According to the logic of fixed-asset-accounting, a so-called payroll account is kept for each employee, on which the wage components and the individual deductions for each month are listed in one line. Due to the large number of required columns, several tables for payroll components and deductions can be maintained. Then, e.g. a table for all deductions led from the wage, and deducted in the actual payroll (journal) only one amount. In payroll journals, the same column breakdown shows the data of the respective payroll month for all employees. The data for the individual employees are processed in addition to the payroll, which forms the basis of the salary payment. The sum of the deductions forms the basis for the payments of taxes and social security contributions; the sum of the wage types used to post the personnel costs. Due to the details in payroll accounting, a condensed amount is sufficient for a posting to G / L accounts.

2.6. Cash Flows

The depiction of monetary flows was not given any special significance in the 1494 system. A presentation of cash flows was therefore not planned. In

Anglo-Saxon countries this value was emphasized. In addition to wealth, capital and success, the payments that are roughly allocated to operating, investing and financing activities should also be presented. Subdivisions are useful.

If you want to observe the cash flows, the cash balances can be recorded in sub-accounts in order to record a (original) cash flow measured directly on the payments made according to the direct method (corresponding to real life reality). IAS 7.19 recommends the direct method of receiving payments for the sale of goods and the provision of services, incoming payments from user fees, royalties, commissions and other income, payments to suppliers for goods and services, payments to and for employees, payments and reimbursements income taxes and others in operating cash flow. You can create subaccounts for the opening balances and these cash flows, which can be transferred to an account for the final inventory at the end of the year. However, the daily work would be made more difficult because a comparison between the stocks according to bookkeeping and the actual cash holdings is very extensive. But with computer support this could be organized.

2.7. Cost Accounting

Although a cost accounting was already carried out by the trading house Fugger in the 16th century, the techniques were developed only after industrialization. The problem of Accounting 1.0 is its one-dimensional representation. When posting to accounts, you have to decide on an outline

criterion. However, cost accounting is about the entire value creation process, which spans from input via production to output and thus has to represent these three dimensions.

An operating settlement sheet realizes two dimensions by assigning the cost elements (input) in a table to cost centres (places of value added = production) at the same time. The third dimension can be created with a BAB II and an allocation of cost centres to payers (output). In the case of this tabular solution, accounts were subsequently manually evaluated in Accounting 1.0 and the second dimension (cost centre) was added.

On the other hand, cost accounting on special accounts should allow immediate entry of cost centres or payers and thus be more accurate. With the concept of cost accounting in accounts, direct costs that could be directly attributed to the products were posted to cost object accounts and the overhead costs, which could only be assigned to departments, to cost centre accounts. Then, the cost center accounts should be distributed via the cost object accounts and then completed via an operating result account.

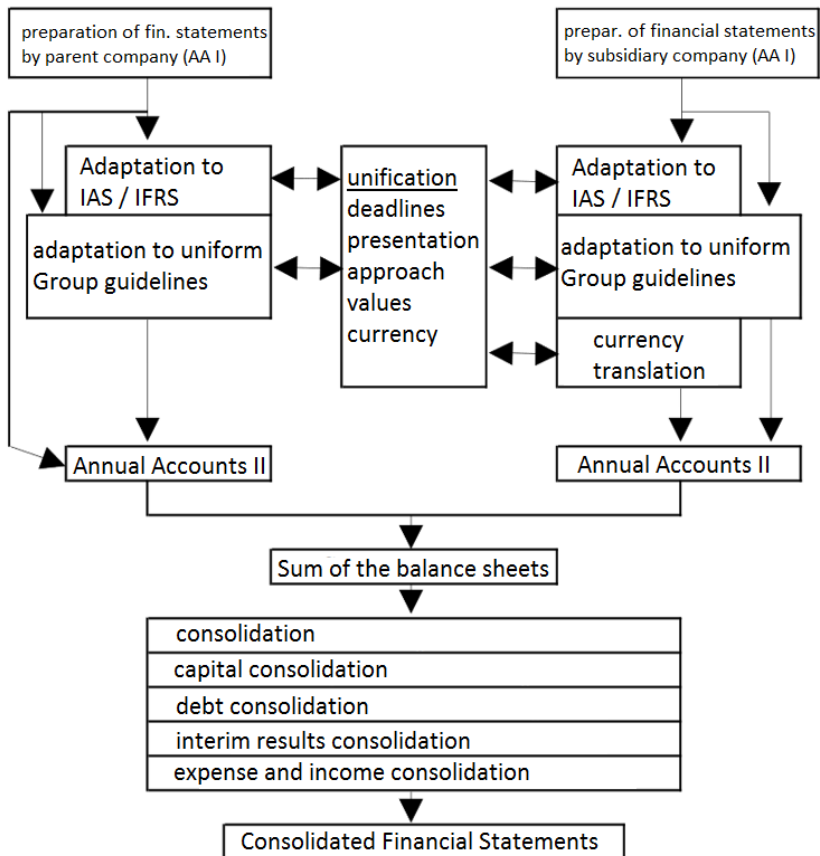
This type of costing and the determination of the results per cost unit involved disproportionately high expenses. The advantage that an immediate booking of the cost centres was made, however, was low. It is understandable why this technology was not practiced by the companies at all, or for a very long time. Nevertheless, some terms of this technique (e.g., operating income account) are still found in the textbooks, although their authors may not even know the old method.

2.8. Consolidated Financial Statements

The distinction between legal and economic unity was of no importance at the time of Paccioli. Only with the industrialization and the emergence of the joint-stock companies also economically dependent enterprises developed, whose stock majorities were held by other enterprises. First economic empires emerged.

A group is a group of legally independent companies that are under the joint management of a parent company. The bookkeeping is organized by the individual companies. However, the management of the group and also the public have an interest in controlling the corporate group as an economic unit. For this purpose, in addition to the separate financial statements of the legally independent companies, consolidated financial statements have been developed for the corporate groups. In them, the group is presented as if it were a legally unified company.

Fig. 7: Group consolidation



Source: D. Baukmann / U. Mandeler, International Accounting Standards: IAS und HGB im Konzernabschluß, 2nd ed., Munich / Vienna 1998, p. 18

Especially with international corporations there can be different problems. Amounts in other currencies have to be converted and the accounting of the

different countries can be organized differently with different legal bases. Then, each group company must first prepare a financial statement based on the parent company's rules. This is not very easy if the bookkeeping continues to build on its own rules. The uniform financial statements according to the rules of the parent company are referred to as Trade Balance II.

Thereafter, the trade balances II of the entire group of companies are added up to the aggregate balance. However, this also includes transactions that took place between the Group companies and that would not have existed in a single company. The parent company also accounts for the interests in the group companies that would not exist in a single company. The equity of the Group companies is also included in the aggregate balance sheet; but in a single enterprise this would not happen. This separation of internal processes from the figures of the group of companies is called group consolidation.

Group consolidation is to be tabulated in Accounting 1.0. A group accounting is not planned.

2.9. Other systems

Besides the double entry system, there are other systems that cannot be traced back to Paccioli.

2.9.1. Single-Entry-Accounting

Following the abrogation of the Accounting Directive in 1953, only HGB was required, which did not require a specific accounting system. The minimum requirements of an accounting are, according to the judgment of the Federal Fiscal Court of 23.02.1951, Az. IV 15/51 S:

- + timely and orderly recording of all business transactions in one or more journals,
- + Control of receivables and liabilities with personal accounts or orderly document storage,
- + annual statements with stocktaking.

It is therefore sufficient if a profit and loss statement (P & L) can be drawn up from the journals and the balance sheet is based on an inventory on the reference date. A minimum level of profit and loss would be a distinction between sales, cost of materials, personnel expenses, depreciation, overheads and interest. This information should be kept ready by the journals. Inventory accounting could be used for the material expenditure, payroll accounting for personnel expenses, and asset accounting for depreciation. The remaining simple bookkeeping would then need to capture sales, overheads and interest rates. It would be important that not only payments, but also unpaid bills are taken into account.

Single-Entry-Accounting provides small business opportunities to perform their duties with simple spreadsheet solutions.

2.9.2. Cameralistics

The cameralistics is the accounting of the state. Deposits and payments for a specific purpose, previously determined in a budget, are recorded here. The technique of accounting for accounts according to Paccioli is used for this, but no balance sheets are set up. Instead, the requirements of the budget, as decided by Parliament, will be entered in the revenue in debit and expenditure in credit as the opening entry. Subsequently, current receipts in the credit and current expenses in the debit are posted to these accounts. At the end of the year, the remains are returned to the Ministry of Finance.

The cameralistics is simple and complicated at the same time. It is complicated because a large number of accounts must be maintained with the multitude of uses. At the same time, it is simple because many issues are not taken into account. Investments are taken into account as expenditure, but there is no control of the residual value and a consideration of the ongoing depreciation loss. There is also a lack of consideration of future issues that have been caused in the past, e.g. Pensions. Cameralistics is therefore not a procedure that should be transferred to companies. It also does not meet the minimum requirements for an accountancy, as they were formulated in Germany by the courts.

2.9.3. Revenue-Surplus-Calculation

Also, the Revenue Surplus Calculation (EÜR) is not an accounting but records for non-accountable small businesses as a simplification process for taxable

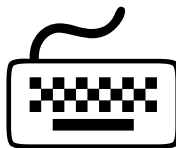
income determination. It has gained in importance with the introduction of Sect. 241a HGB and the exemption of small individual merchants from the accounting obligation. As an attachment to the income tax return but still a three-page form to fill in whose questions require a precise record of details. The question then arises as to whether computerized accounting would be simpler than the simplification procedure.

The EÜR is limited to the time of payment. This also opens up some design options. If, at the end of the year, the entrepreneur does not write any more invoices at the end of the year - of course due to work overload - he will no longer have any operating income in December. After Christmas, he has time again and writes all the bills in a few days. The operating income then falls in January and will be taxed only in the new year. He also has time after Christmas to pay all bills - even those not yet due. Thus all payments fall into the old year and are deducted there also in the determination of the income. There are no stocks. The purchase of goods is immediately considered as an operating expense, even if all goods are still in stock at the end of the year.

But unlike in cameralistics, small business owners keep a record of their investment in the revenue surplus bill. They cannot immediately deduct the purchase of these items as business expenses for tax purposes. These are distributed over the period of use and additionally deducted from the income as depreciation. Therefore, this method is suitable for small businesses, a profitability control or the evaluation of products with a cost accounting is not provided here. So here is a trade-off between making work easier and better information.

3. Accounting 2.0

When the accounting department discovered the EDP.



3.1. System

With Bookkeeping 2.0, Bookkeeping 1.0 is initially replicated only electronically via a financial accounting software (FinAcc). Nevertheless, there are also clear differences. The core of FinAcc is a file with the current postings, from which accounts and journals are supplied with data. All data is recorded in the file via an input mask, or copied in via interface and data transfer.

As a legal requirement, it must be ensured that the bookings cannot be changed later. Unlike a detection on paper, however, an error correction can be made possible. A booking is considered to have taken place when the journal was printed with this booking. However, they are then only provided with a flag that they must not be changed anymore, and the next journal only prints postings without this flag. There are also other characteristics, e.g. for paid invoices (which corresponds to the figures - see 2.5.1. -) or open items.

The file assigns the postings to periods. This can be controlled by the document date or with a separate input. There are usually 14 periods per year. A period 0 includes the balance carryforward from the previous year. Here only automatic bookings are possible. In periods 1 to 12, the current transactions of the individual months are recorded. A period 13 records the operations that should not be assigned to a particular month. These are in particular corrections and valuations in the context of the annual financial statements. But even with quarterly statements, you could record such postings in period 13. For each

financial year, a separate subdirectory with data from 14 periods is maintained. This allows you to switch between the databases of several years. When a period is closed, it can no longer be booked in it. The data is retained and can be evaluated without restriction.

FinAcc clearly differentiates between database and evaluation. While in Bookkeeping 1.0 the data was still recorded in journals and accounts, they are only evaluations in Bookkeeping 2.0. Balance sheet and income statement are independent evaluations in addition to the accounts. There are therefore no final bookings. At a turn of the year, a new subdirectory with the following year is created and empty accounts are first copied into it. Subsequently, the final balance of the balance sheet accounts is entered automatically as the balance carryforward in the period 0 of the new year. The sum of all offsetting postings corresponds to the profit of the previous year. For changes in the old year, the balance contracts are updated.

While in Accounting 1.0 the balance was defined as the settlement amount that offsets debit and credit and that was transferred to the balance sheet or income statement, the balance in Accounting 2.0 is the debit or credit overhang. Assets therefore regularly have a debit balance, even though they were transferred to the balance sheet in the accounting system 1.0 with a credit posting (called the balance). So here are the old terms for about 40 years out of date.

The evaluations of FiBu are today mainly generated as a file and kept electronically. In addition to this archiving, the data can also be made available for various tasks in the company as a data source. For this purpose, it must be

asked who needs which information for his tasks. In addition to legal requirements, these requirements determine the scope of the accounting 2.0.

3.2. Journals

In Bookkeeping 1.0, there was the alternative of keeping a journal for all bookings in strict chronological order, or several different voucher journals for different groups of business transactions, which were then kept chronologically within that journal. Because the journals in Accounting 2.0 are pure evaluations, there are both possibilities side by side.

By printing the booking journal, it is decided that these bookings cannot be corrected. Therefore, mechanical test procedures must be carried out beforehand. Other plausibility checks should also be performed, e.g. whether the cash balances on the accounts match those on the bank accounts or in the cash register. Because the accounting journal reproduces the Journal of Accounting 1.0, it is organized according to the order of data collection. It is therefore more of a documentation and bureaucratic duty than a meaningful evaluation.

In contrast, the document journals are controlled by the document type and the document number. Further limitations are possible. So could e.g. an evaluation with all invoices of a specific number range can be generated on paper or file. For the document journals, the order of data entry is not important. Document

journals are more like work aids for specific tasks. But it is also possible that e.g. Monthly complete document journals are created as documentation.

With small extensions it is also possible to generate sorted evaluations according to every other criterion. Alternatively, a data export of all postings could be generated, which can then be read in with a spreadsheet and then sorted. So could e.g. sorting by booking text. Then it would have to be organized that meaningful entries would be made according to which sorting would make sense.

3.3. Accounts, Bookings and Interfaces

Like the journals, the accounts are not a data store, but an evaluation. Therefore, the printed out on paper accounts have little meaning. On the other hand, it is important to be able to display an account on the screen. If the data were not outsourced, this is also possible for earlier years. This applies to personal accounts as well as general ledger accounts. Because of this constant accessibility, a printed annual account statement is usually sufficient, which can then be produced as a file. Accounts with a large number of postings can also be defined as a summarized account, with which all debit and credit postings in a period are condensed into one number. The details can be read with a screen view.

In the programs, it was planned that the documents were individually entered into a data entry screen via the keyboard and screen. This had the advantage

that man could also transfer different processes into a common scheme. This could require a very complex data entry. Over time, however, data transfers from other applications have become increasingly prevalent. The following example describes an interface with which invoices settled 20 years ago could be transferred to accounting. When transferring data from other applications, the records had to be structured similarly. With flexible interfaces, data transfer became much easier.

Pos.1	Pos.2	Length	Type	Designation
0	6	7	N	Account number
7	7	1	A	Document type
8	13	6	A	Document number
14	19	6	A	Document date
20	38	19	A	Booking text
39	39	1	A	Code B = GROSS / N = NET
40	52	13	N2	Gross amount (Total)
53	65	13	N2	Net amount (Total)
66	128	63	N	9 Costs each 7 digits
129	191	63	N	9 Revenue accounts (counter accounts) 7-digit
192	308	117	N2	9 Gross / net. (if necessary in foreign currency)
309	362	54	N2	9 VAT rates per 6-digit
363	363	1	N	Code currency (additional foreign currency)
364	370	7	N	Conversion factor (add. Third party)
371	385	15	A	Document number Supplier
386	386	1	A	Blocking / payment note Booking: L = direct debit, E = debit, V = value
387	392	6	N	value date (if pos. 386 = "V"!))
393	393	1	A	Booking mark / side S = debit, H = credit
394	403	10	A	Search name Person account
404	433	30	A	Postal code / City personal account
434	463	30	A	name personal account

Pos.1	Pos.2	Length	Type	Designation
464	493	30	A	Industry Personal account
494	523	30	A	street person account
524	543	20	A	Telephone Person account
544	563	20	A	Fax Person account
564	578	15	A	Account number (bank master) personal account
579	586	8	N	Bank code (bank account) Person account
587	611	25	A	Bank name (Bank master) Person account
612	636	25	A	Comment Person account
637	652	16	A	VAT ID number Person account
653	667	15	A	Customer number at the supplier (Personal account master)
668	677	10	N	Credit Limit
678	678	1	N	Indicator Reminder 0-9 (see "Dunning") personal account
679	680	2	A	Representative person account
681	683	3	N	Net days personal account
684	686	3	N	Skonto1 days personal account
687	691	5	N2	Skonto1% rate of personal account
692	694	3	N	Skonto2 days personal account
695	699	5	N2	Skonto2% rate of personal account
700	700	1	A	Registration abroad N, E, D personal account
701	701	1	N	collection item. Pers.kto. (only with new plant)
702	707	6	A	Document date (if different from Booking date)
708	709	2	N	Term of Payment ("X" at position 708 effects acquisition of the payment conditions from the personal account master record
710	748	39	-	Free (always occupy with ASCII 32)

These 44 fields with 748 characters were basically also available for data acquisition on the screen.

Meanwhile, more flexible interfaces are common. Thus, e.g. a particular field is addressed with a code or certain sequences are specified for the fields of the import files, which are separated with TABs. You can also generate your own data from a spreadsheet and read it into the accounting department.

3.4. Reports and Closings

The central task of accounting is the evaluation of the entered data. Data collection is a necessary task, and archiving a chore, but technically supported. Accounting 1.0 focused instead on data collection and storage.

3.4.1. Totals- and Balance Lists

The totals and balance lists are a compact evaluation of the stored data. Because before the digitization of such lists had to be laboriously created with an aggregation of the bookings of all accounts, and it often came to arithmetic errors, this type of evaluation was rarely used in the past.

It shows a table with the account number, account name, opening value, total of the periodic and cumulative year entries, each in debit and credit entries, as well as the current balance. In the totals and balances list, debit balances with a positive value and credit balances with minus are displayed. These lists can be displayed on the screen or printed on paper.

However, the balance lists can only show an amount if the accounts were not closed on the balance sheet or the income statement. Otherwise, each account would have a value of zero and this important evaluation would be worthless.

Totals and balance lists can be generated for G / L accounts as well as for personal accounts. You can narrow them down regularly by number range. For balance lists for personal accounts, you can usually choose between sorting by account number or name.

3.4.2. Balance sheet and income statement

As the balance sheets were no longer painstakingly created by hand, but were constantly available with EDP support, it was possible to print out a balance sheet with a profit and loss account from around 1990 at any time. Of course, only the data entered previously could be processed.

For this purpose, the balance sheet and the income statement must first be set up with their texts. Each row is assigned an amount field for the data of the current year and one for the previous year's data. For totals and subtotals, formulas are stored in the amount fields. For the amount fields not used with formulas, the items to which these accounts are assigned are stored in the master data of the G / L accounts. There can be a fixed assignment. Alternatively, you can define that accounts with debit or credit balances should be assigned to different balance sheet items. Because the software issues credit

balances with minus, a reversal of the sign must be provided for the liability side of the balance sheet and for the profit and loss statement. In the income statement, one can limit the sign reversal to the income and take into account the "natural minus" of the effort in the sum formulas.

An alternative approach is the interposition of account groups. As in the case of a clear balance sheet in Accounting 1.0, where the accounts were initially closed via balance sheet items that had to be closed again via the balance sheet, the balance sheet and P & L form is assigned account groups that are defined with a letter code instead of a numerical account number. The account groups define which accounts and which sign they are composed of. This has the advantage that accounts can also be considered in several balance sheet and P & L items, e.g. in two positions with plus and one with minus. This made a much more flexible design possible. Further evaluations could then be made using the same technique (see 3.4.5 List Generator). If then a completely free form design has been made possible and e.g. individual numbers should also be included in a sentence (e.g. "... of which XX.XXX, XX € with a residual maturity over 5 years"), then had to be flexibly defined in the format of the number field, which value of the account group (month or year, current or previous year, ...) should be specified.

This possibility of constant presence of balance sheets and profit and loss accounts is only given if the accounts keep their balance is no longer completed on the balance sheet and income statement.

3.4.3. Business Evaluation (BWA)

The development of the BWA is due to the German tax consulting organisation DATEV. Shortly after its founding in February 1966, when DATEV introduced its data processing system in February 1969, it published its "standard BWA No. 1", the most common and widely used version. The BWA system was intended as a reporting system on the profit situation of companies.

The BWA only records business transactions that affect the income statement. For this reason, all income and expenses and revenues are included in BWA. It is structured according to the scaled form of the income statement (Sect. 275 (2) HGB) and therefore starts with the revenues, followed by gross profit, the cost types (such as personnel costs, material costs), interest expense / interest income, taxes and the preliminary result. The under-year BWA is based on a "soft month close" (English soft close). In a second step, these business data can be used to determine business key figures that can be used to compare industries. The standard BWA No. 1 is always uncommented and therefore cannot be compared with an annual report. In addition, it contains no balance sheet figures and is therefore not comparable to financial statements.

The informative value for the companies would be the same, if in the technical preparation of balance sheet and P & L with a list generator in another form, the income statement would be subdivided and added key figures and the evaluations would then be created monthly. On the other hand, a too large variety of differently structured evaluations with the same statements might rather confuse the management.

3.4.4. VAT return

The Value-Added-Tax (VAT), is the most important type of taxation in the European Union. In Germany, it accounts for just under 31% of tax revenues, followed by wage tax at just over 26%. Both tax types must be managed by the companies. You must calculate the taxes, register and transfer them to the tax office. The administration of sales tax is particularly complex. Accounting 2.0 has developed technical solutions for this. They have seduced the state to make the anti-abuse rules even more complicated and to charge companies with even more bureaucracy, for which the software providers then had to work out new solutions. In Accounting 1.0, these tasks would no longer be possible.

Value added tax is burdening consumers. In principle, the general tax rate applies to all prices of taxable entrepreneurs (the definition of entrepreneur is very broad and only very small companies are exempt). There are also groups of discounted taxed (for example, food, books, ...) and tax-exempt sales (e.g., rents, interest, exports). In Germany, the general tax rate is 19% and the reduced rate is 7%. The taxes that an entrepreneur has already paid on the prices to other entrepreneurs (= input tax), he may deduct the payment to the tax office. Those who only carry out tax-free transactions do not get back the tax paid to other entrepreneurs (exception: exports). If an entrepreneur executes taxable and tax-exempt transactions, part of the tax paid is not deductible. There are also transactions in which an entrepreneur as a buyer may not pay the tax to the performing entrepreneur, but directly to the tax office. He must treat these "reverse charge cases" separately. There is also a specific

approach when delivering to or receiving services from other countries of the European Union.

The companies must therefore record their sales and the tax surcharge separately. In addition, they must also enter the net amount and the tax premium separately for all purchases and record intra-EU sales and purchases as well as reverse charge cases. Sales tax codes are used for this. Each document gets a label that marks it as

- taxable turnover with general tax rate
- taxable sales at a reduced rate
- tax-free export
- tax-exempt intra-Community delivery
- other tax-free sales
- Sales executed abroad
- Sales in the reverse charge process
- Purchase with general tax rate for taxable sales
- Purchase at a reduced tax rate for taxable sales
- Purchase for other tax-free sales
- Purchase in reverse charge procedure
- Purchase with general Tax rate for tax-free and taxable sales
- Purchase with reduced tax rate for tax. and taxable sales
- Purchasing from other European Union
- Import from other countries

The indicator can also be stored in the G / L account to which the transaction is posted. Then only transactions with the same tax code can be recorded there. For sales transactions, a G / L account may only contain postings with the same tax codes.

The VAT return, which informs the tax office on a monthly basis of turnover tax and calculates the payment to be made by the undertaking itself, must indicate separately the different sales, the purchases from other European Union countries and the reverse-charge purchases. In addition, the deductible input tax (tax paid to other entrepreneurs) must be stated. This data is assigned to a form line. For mixed taxable and tax-exempt transactions, the other data is needed to calculate the deductible input tax.

The data can not only be used for the tax filing form, which is now electronically transmitted to the tax office. You can also create your own reports according to the tax codes.

3.4.5. List Builder

Because accounting 2.0 attaches great importance to evaluations, ie the preparation of data for addressees in the company, a flexible instrument for freely formulated regular evaluations is also important. For one-time evaluations, however, one would use a spreadsheet and not an accounting software tool. In section 3.4.2. We have already mentioned a procedure for flexible evaluations in which a free text can first be formulated, inserted in the data fields and assigned to these account groups. Other assignments such as e.g. a date or the current month are possible.

Another possibility of free evaluations is in tables for which rows and columns can be freely assigned. Software solutions that offer this option do not

regularly define account groups. Instead, it is first assigned whether the items should be assigned in the rows and different periods in the columns (for example, month, year / current year, previous year / ...) or vice versa. Then the facts must be described in account areas (from account ... to account ...) or as an enumeration of individual accounts.

3.4.6. data export

An alternative to the list generator is the possibility to export data. Each evaluation (accounts, journals, lists) can be output not only on paper, but also in file formats. The PDF format can already be achieved with the selection of a PDF converter as a printer.

The PDF format can already be achieved with the selection of a PDF converter as a printer. In addition, if the program allows the output of the data in a text or database format (e.g., CSV or DBF), the output file can be opened and processed with a spreadsheet. Would e.g. a balance list for all accounts (even accounts without bookings) is output as a file and then imported into a spreadsheet, then each amount of an account would have the same position for each output file. A balance sheet and P & L could also be created by reading the output file into a worksheet and another worksheet with balance sheet and P & L containing cell references to accounts and account areas in that workspace. Using the same procedure, any other evaluation could be created from the imported balance list that processes the balances of the current year's accounts.

The data exports would even be suitable for spontaneous evaluations, in which the user initially reads a balance list of G / L accounts into a spreadsheet file in order to first of all seek an answer to his questions. If he found her, he could also save his solution and reuse it if necessary. With the possibility to export data, the importance of the own evaluations of accounting programs has decreased. Spreadsheets are often preferred by users because of their flexibility.

3.4.7. monthly and annual financial statements

For monthly and annual financial statements, a distinction must be made between the technical and organizational procedures. Technically, in a monthly statement only the respective period is blocked for further bookings. Therefore, a monthly statement presupposes that all journals have been printed, the bookings have been checked for correctness by the software and a data backup has been carried out. In addition, the software may require prior to the execution of the monthly statement, that a minimum amount of evaluations has been created. Because reading access to all data is still possible after the end of the month, the evaluations would still be possible later. If the postings for completed periods are to be outsourced to a data carrier and then deleted from the hard disk, a printing of the G / L accounts would be necessary. Due to the meanwhile very large capacity of the data carriers, this outsourcing is usually not necessary during the current financial year.

3.5. Sub-ledgers

Digitization has had a particular impact on the secondary accounting. Because the coordination between sub-accounts and G / L accounts was now done automatically and a synchronization was guaranteed, the possibilities widened. The usage was reduced to the question of whether the added benefit justified the additional costs.

3.5.1. Personal accounts and payments

The personal accounts were already provided in 1494 at Paccioli and are the oldest variant of sub-ledgers. In Bookkeeping 2.0, the application possibilities with the use of interfaces have increased significantly. For example, orders are managed by customers in a merchandise management software and the invoices created for executed orders are first transferred to the accounting department. The customer numbers must then match the customer accounts and the G / L accounts for sales and VAT must be stored in the ERP system. Otherwise, the merchandise management but more concerned with the order processing of the offer on the order for delivery. That is why customer numbers are already being issued for potential customers who only asked for prices. From the perspective of the seller, this is important information for the acquisition of new customers, from the point of view of accounting would be this garbage. For accounts receivable accounting, it is still about the incoming payment control and possibly the reminder of overdue invoices and a response to the seller.

Comparable processes can also be provided by the merchandise management for the purchases. Because a preliminary run exists, from which the delivery date and the correctness of the delivery are checked, a data transfer can take place here by interface, despite an incoming supplier invoice. This effectively transfers the data collection from accounting to purchasing, which then has to be sensitized to the formal requirements. Here, too, there must be a synchronism of vendor and vendor numbers, and Accounts Payable Accounts may complete the data prior to the machine transfer on the basis of the audited incoming invoice, and then organize payment by electronic banking.

These sub-books become independent. A transfer posting of the person accounts to G / L accounts could already be avoided in the accounting 1.0 with journal columns. Following the same logic, the postings to personal accounts are simultaneously posted to accounts receivable and payable accounts, usually as a daily amount after the journal print. For this purpose, collective codes are stored in the master data of the personal accounts, with which different collective accounts can also be accessed. These accounts must be locked for manual postings.

3.5.2. Fixed-Asset-Accounting

In section 2.5.4. was already mentioned Sect. 284 paragraph 3 HGB and the recording of the total acquisition and manufacturing costs, additions, disposals, transfers and write-ups of the financial year and accumulated depreciation start and end of the fiscal year, the depreciation and amortization made in the fiscal

year Depreciations in their total amount in connection with additions and disposals as well as transfers during the financial year.

Fig. 8: Fixed-Assets-Reporting

Fixed - Assets - Reporting		
Assets-Accounting	Plant-Costing	Plant-Perform.- Accounting
acquisition cost replacement cost depreciation residual value, interest useful life update	current input (units / money) maintenance (money) repairs (money)	current output (units / money) workload (units) standstill, defected products (units)

(Source: own representation)

Because this is about managing investments, asset accounting is often expanded into asset reporting by adding investment asset-related costing in asset allocation and performance data in asset performance accounting. All you need is a numbering system for the capital goods and a recording option in accounting and statistics. This will allow you to collect data for later replacement or expansion investments and also to control your previous assumptions in order to learn for the future. At the same time, tendencies to calculate decisions are counteracted.

In Bookkeeping 2.0, asset accounting can be expanded into a complex investment controlling that would not be feasible with the 1494 technology.

3.5.3. Inventory Accounting

Inventory Accounting in Accounting 2.0 was able to recreate electronically the approach created in Accounting 1.0 with the quantities, price and amount. For purchases from purchases, the quantities and amounts were available; the price (including pro rata ancillary costs) could be calculated. For disposals, quantity and price (as assumed value) were known; the amount for the accounting was calculated. As with personal accounts, different goods can be assigned to a G / L account using collective codes. But there must be significantly more collection codes than with receivables and liabilities.

Because the counter accounts (vendors in the case of purchases and material expenses in the case of sales or consumptions) are always the same, they can be stored in the warehouse accounting software. Only cost centers and payers are different for the departures from the stocks. Purchases that are consumed immediately without intermediate storage can be booked as both an entry and a simultaneous exit. The same applies to purchased services that are already physically non-storable. In this way, the inventory accounting can use the entire material expenditure (including related goods and services) and the purchasing activity for this purpose.

As with manual stock accounting, the focus is on capturing purchased and used units of measure. However, the automatic processing of the data to the input of the operation allows the linkage with output data on which the input quantities depend. Thus, input-output relations are determined, prognoses for the future and for simulations of different action alternatives are of central importance.

From this follows the desire to extend the "quantity-by-price logic" also to overhead costs, where the purchases are not recorded in the warehouse accounting.

3.5.4. foreign currencies

Foreign currencies in accounting 2.0 are an expression of globalization rather than the petty-bourgeoisie of the Middle Ages. With the introduction of the euro, the importance of foreign currency accounting in Europe has shifted. For the countries of the euro area, the importance has declined sharply, while in other European countries (including non-EU members), the euro is accepted in part (at least in border regions) as an unofficial secondary currency. Here, the processing of foreign currencies has become an important function of accounting. In addition to handling international day-to-day transactions, a common currency is also important for reporting in international groups. In many high-inflation countries, value-stable currencies are often used for reporting even without international integration. For the cash holdings, import and export transactions, the reference to the stock accounting has been preserved.

When reporting in foreign currency, all transactions from the national currency must be converted into the reporting currency. This raises the question of whether the conversion according to the rates at the respective time of the transaction (time reference method) or whether the price on the reporting date (reference date method) should be used. This can have a significant impact on

the picture in the event of strong currency fluctuations (for example, the US \$ as the reporting currency) or a strongly inflationary national currency. For example, In the case of the reporting date method, an investment in local currency would be unrealistically low if the price of the reporting currency had risen sharply following the investment date. Both methods can be implemented more technically, even if the time reference method is more complex. Here, the conversion rates must be updated daily or weekly. A second database must be maintained for the reporting currency.

3.5.5. Payroll

The translation of payroll accounting into digital form is a simple task. You only need the individual records for the respective employees and periods. Now only the individual records are printed as payroll; sorted by employees, they form the payroll accounts and sort the payroll journals by periods.

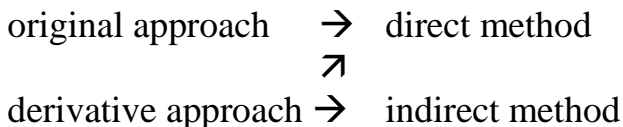
With machine processing, however, the database of the wage calculation can also be analysed. In production, it is registered which worker has been working on which product for how long. The scarce resource work should be used effectively, and one work is ready, already waiting for the next task. This applies to all work, not just to the production of products for sale. It is now also possible to determine which worker can perform the tasks faster and better. With this knowledge, everyone can be used primarily where it gives the best results.

In the pre-industrial era and the early industrial society, the production factor of labour was seen as a cost factor; Workers were easily interchangeable. In the late industrialized and post-industrial times, staff are increasingly understood as a potential factor and thus as an investment. Simple work can increasingly be done by machines. Qualified workers must be trained and trained. They are a prerequisite for the performance of companies. Payroll accounting should therefore develop in the direction of investment controlling.

3.6. cash flows

The desire to present the cash flows and their presentation or assignment to operating, investment and financing activities raises the question of how the data can be determined and how a breakdown of the three cash flows can be made. Both are due, because a breakdown according to a certain criterion is only possible if the procedure provides the necessary data for it. It is possible to differentiate between a primary and derivative approach as well as between the direct and the indirect method. The relationships to each other can be represented as follows:

Fig. 9: Cash flow procedures and methods



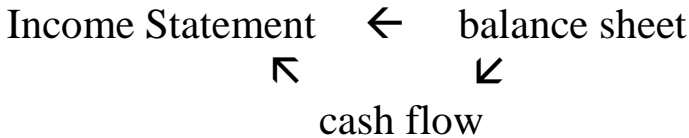
(Source: W. Müller, Investment Accounting, Financial Planning, Financial Instruments, Norderstedt 2011, p. 92)

In the original procedure, the payment data is collected independently. This can e.g. This is done when booking any payment on sub-accounts. Another possibility would be to perform a database export of all postings to the cash accounts, and to sort these completely exported posting records for different characteristics. For example, It can be determined from the counter accounts that payments via customer accounts must concern the customer payments and those via vendor accounts the supplier payments. Other characteristics such as the document numbers or possibly also the posting texts - if this was previously organized - can allow a classification. With a structured sequence of sorting processes more and more processes can be assigned.

Only a small remaining remainder would have to be assigned individually. The disadvantage of this approach is that the data is not available as an automatic expression from the financial accounting software. If e.g. Subsequent corrections made, it would always be necessary to check individually whether this would also affect the presentation of the cash flow. This must be taken into account in the process organization. The original approach would be an isolated solution in this form.

For these reasons, most companies prefer the derivative approach of deriving the cash flows from the accounting data. Thus, while the original approach is based on the entries in the cash accounts, the derivative approach examines all other accounts, that is the sum of all offsetting entries. This is based on the knowledge that all postings follow the following triangular logic:

Fig. 10: Triangle logic of posting records



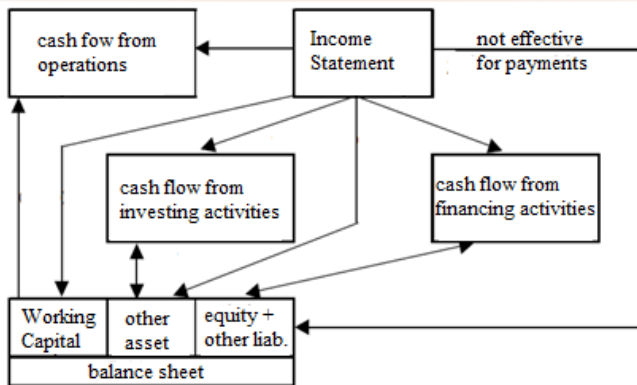
(Source: W. Müller, Investment Accounting, Financial Planning, Financial instruments, Norderstedt 2011, p. 93)

All transactions for normal business transactions take place either between the profit and loss statement and the cash flow, the balance sheet and the cash flow or the income statement and the balance sheet. If two of these quantities are known, the third can be calculated because the sum of debit and credit entries must be the same. This logic can be limited to the three activities (operational, investment, financing). Instead of assets and liabilities, the balance sheet is broken down into working capital, other assets and other liabilities.

Working capital consists in particular of inventories, receivables and liabilities. In the operational area, the income statement forms the focus. Non-cash transactions take place in working capital, which also includes non-cash payments. Investment activity focuses on fixed assets, ie other assets. Financing activities, on the other hand, are shown under other liabilities. Non-cash transactions in the case of investment and financing are recognized in the income statement. The vast majority of operating income and expenses will also be cash-effective in the respective accounting period. Income and expenses may not be cash-effective, e.g. Income from the reversal or expense from the formation of provisions.

Thus, the triangulation logic can be concretized as follows:

Fig. 11: Triangle logic in detail



(Source: <https://mueller-consulting.jimdo.com/finanzen/investition/>,
Download file I + F-7c.pdf)

Insofar as operating income and expenses are not immediately cash-effective, unpaid income and / or additional payments for prior-year expenses increase working capital. If receivables from the previous year are additionally paid in and / or expenses are not yet paid, the working capital is reduced by the reverse order, which leads to an increase in cash flow from operating activities.

Cash-effective income also arises from the return on financial investments or from neutral assets or the sale of fixed assets. They are usually not part of the operational area. Depreciations and write-downs on fixed assets and marketable securities are non-cash, but are required to calculate capital expenditures. The same applies with the opposite sign in the case of income

from attributions, e.g. for value reversals. Interest income and interest expenses are generally cash payments and can also be presented in cash flow from financing activities. Additions to fixed assets and marketable securities are recognized in the income statement and relate to cash flow from investing activities. Additions and disposals of equity and debt capital (with the exception of working capital) are financing activities. Non-cash expenses and income (with the exception of depreciation) relate, for example, to the setting in or draw of provisions.

Only the cash holdings are excluded from this classification. Because the derivative approach captures the cumulative offsetting entries for payments, cash is used only to verify that the cash flows have been recognized correctly and fully.

In accordance with International Accounting Standard (IAS) 7, operating cash flow is presented using the direct or indirect method. Because the operating activity is mainly reflected in the income statement, the indirect method uses this evaluation. It first corrects expenses and income that are not attributable to operating cash flow and then takes into account changes in working capital. The indirect method can not be used in an original procedure, because there is no P & L available in an independent calculation of payment data that could be adjusted. The direct method depicts the operational cash flows as they occur in reality. This can also be organized in a derivative approach. There are no differences in cash flows from investing and financing activities. Because these are not linked to the income statement anyhow, a conversion from the

profit and loss account is not feasible here. These quantities thus also follow when using the indirect method of direct logic.

According to these findings, cash flow evaluations can be generated automatically using the indirect as well as the direct method with a list generator and retrieved at any time.

3.7. Cost Accounting and Controlling

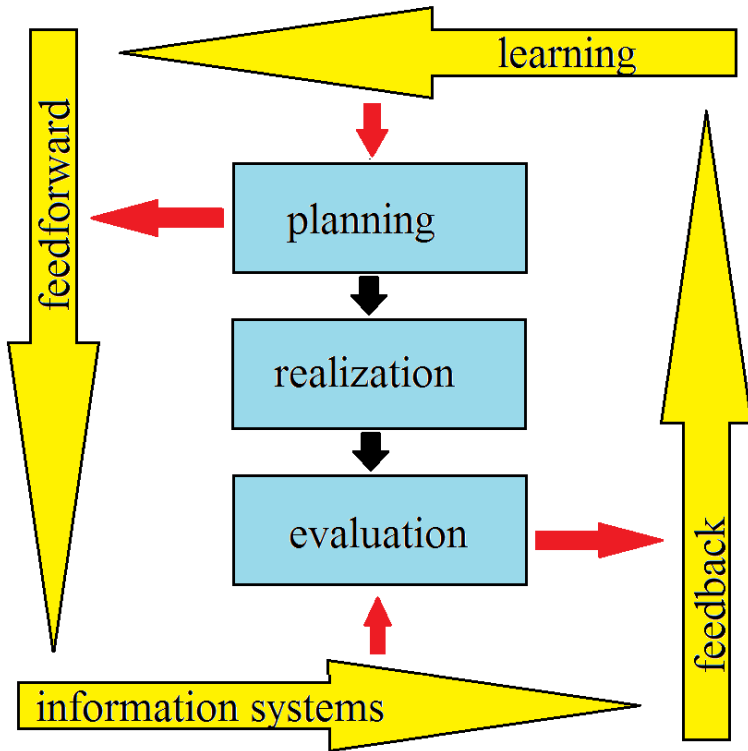
3.7.1. Internal Accounting

The original claim of the accounting was to provide the merchant with information about his business and the economic situation. Only later did the state make use of the existing methods, and introduced an accounting obligation and reporting obligations. The management approach assumes that the accounting system is designed first for one's own needs and only as a secondary purpose must comply with state regulations and fulfil statutory obligations.

The concern of the company management is to analyse, to understand and to improve the value added process shown simplified in Fig. 1 on page 8. At the same time, it should be borne in mind that the company is run not in the past, but in the future. To do this, the basis for decision-making for the future must be created with plans based on up-to-date data. The current data is compared to the plans of the past to deviations between plan and is to analyse. This leads

to the desire to organize learning processes and to constantly improve the company management with the help of planning, information systems and feedback.

Fig.12: continuous improvement process



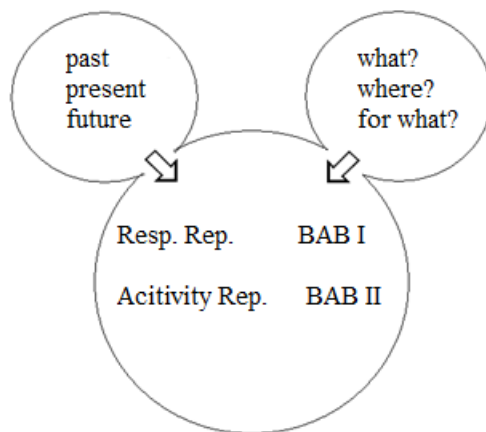
(Source: <https://mueller-consulting.jimdo.com/research/background/>)

According to this philosophy, the task of business administration is the optimization of value creation via the action levels planning-implementation-

evaluation and the support with information systems and learning processes. In addition to capital and labour, the factor information can be regarded as an important component in the creation of the company's performance. Accounting has been the company's central information system for more than 500 years. With the technical possibilities of the 21st century, the database for corporate management can be greatly expanded. In addition, information gathering can be accelerated and organized cost-effectively.

The task of this link visualizes the following Mickey-Mouse-Chart:

Fig. 13: Four dimensions of reporting



(Source: W. Müller, Cost Accounting, Norderstedt 2012, p. 22)

The planning of the future, the implementation of these plans and their control is the central concern. Reporting has the goal of a comparison based on this

comparison The approach of cost accounting, the business value creation with the questions for "what? Where? for what? ", so in the reporting comes together with the demand for cost control, which has to ask the question " when? ", and compares current data with past values and compares them to target / actual.

On the other hand, the activity statement sheets (BAB) I and II have the task of analysing the value chain Input => Production => Output. BAB I shows how the cost elements (purchased goods) are distributed among the cost centres (organizational units in which the value added takes place). Here is between direct costs, which can be directly attributed to the products, and overheads, where this is not possible. In the BAB II, on the other hand, it is about the contributions of the cost centres for the products.

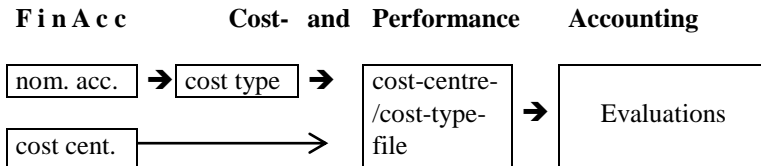
If you wanted to combine both, you would have to create a four-dimensional representation, but this is not possible with the only three-dimensional imagination of man (length, width, height). However, databases do not have this restriction. You can also capture and store information with features of more than three dimensions. Only the summarized evaluations must omit one or two dimensions.

3.7.2. Cost Centres and Products

It is possible to machine the computational transfer from input to output. For this purpose, a cost centre number must be entered in the accounting department next to the account number, but this can also define the cost unit

for individual costs. This generates a cost centre / cost element file from which evaluations are produced as a file and can then be transferred to a spreadsheet:

Fig. 14: data flow for cost and activity accounting



(Source: W. Müller, Cost Accounting, Norderstedt 2012, p. 10)

A sample file for this can be downloaded at <https://www.noteninflation.de/downloads/> (file: BAB-Muster.ods) to adapt to your own requirements.

The account number may also include cost unit information, e.g. with a 5-digit number the first two for the cost centre and the last three for the cost bearer envisages. The cost centres starting with 0 would be for non-company transactions, which should not be included in the cost accounting. In the numbers starting with 8 and 9, no cost object reference would be possible. They can be used as five digits as cost centres. The following example graphically illustrates this idea:

Fig. 15: cost centre numbers

<u>1</u> <u>2</u>	<u>3</u> <u>4</u> <u>5</u>	= Cost-Centre-No.
↓	↓	
Cost Centre (= digits 1 + 2) (principle of performance)	Cost Unit (= digits 3 - 5) (object principle - classes 1 - 7)	
0 ????	neutral	
1?	Procurement / Logistics	000 = no cost unit
2 - 6	production	001 - 050 = projects
7?	Sales	051 - 099 = internal orders
8????	Administration	1?? – 8?? = product groups
9????	Service?	00 = prod.gr. in general
?0	generally	9?? = cost locations
Cost Center Groups	Cost Center Groups	
principle of performance	object principle	
?? 000 - ?? 999	XX ??? (e.g.: 11123, 12123, ...)	

(Source: W. Müller, Cost Accounting, Norderstedt 2012, p. 103)

For cost centres beginning with digits from 1 to 7, the last three digits would be payers. "000" would mean that no payer can be defined. In the example, the numbers 900-999 would be reserved for cost centres, as special evaluation units within cost centres. The numbers 001 to 099 would be provided for projects (temporary billing units) and operating orders (internal cost units).

The machine evaluations for the data transmission would concern cost centre groups, which together form a column in the BAB I. Cost centre groups could also be created for the cost objects, which additionally generate evaluations that support the system of unit costing. Instead of integrating the cost objects into the cost centre number, separate cost centre numbers can also be

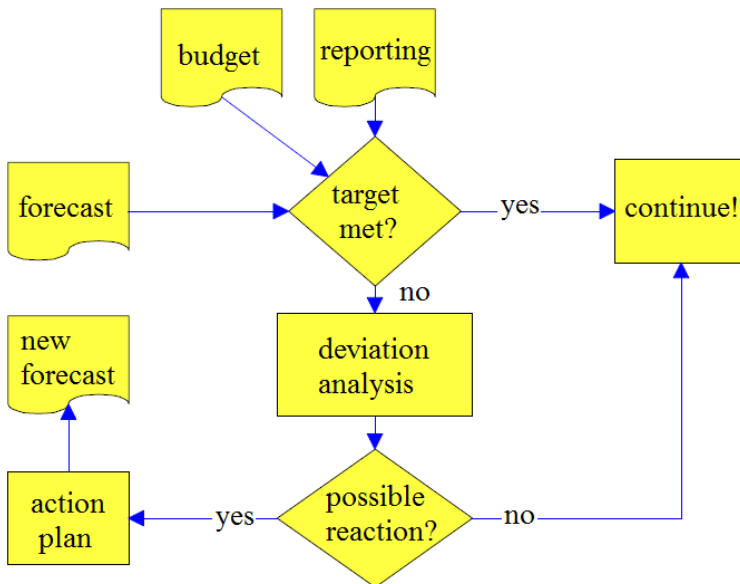
maintained in separate data fields. However, it has to be taken into account that the cost bearers can only be recorded consistently if there are direct costs. Because the additional cost centre number would always be left over in the overheads area, this would mean a significant expansion of the system with little use of the additional dimension.

The entry of cost centre numbers in accounting has realized the idea of a direct acquisition of cost accounting information, which was already planned with the cost centre accounts in the 30s to 50s and was rejected as too expensive again. Computerized cost accounting can thus do with a minimum of human labour, which would be needed only for their set-up and adjustments.

3.7.3. Responsibility Reporting

Reporting as a part of Management Accounting (Controlling) is based on areas of responsibility to which specific persons can also be assigned. Here, on the basis of experiences of the past, goals are first defined, the observance of which is to be observed with the numbers of the respective periods. The areas of responsibility are regularly delimited according to technical responsibilities and therefore essentially correspond to the cost centres (= cost centre approach). It happens, however, that several cost centres form a common area of responsibility. In the operational hierarchy, the higher-level area of responsibility also includes the areas of responsibility assigned to them. This happens according to the following pattern:

Fig. 16: Management feedback



(Source: W. Müller, Integrierte Erfolgs- und Finanzplanung,
2nd ed., Aachen 2004, p. 26)

In the continuous improvement process shown in Fig. 12 on page 63, the reporting covers the feedback. With this feedback for the management, it should be checked in the sense of an early warning system, whether the respective organizational unit reaches its goals, or whether a course correction makes sense.

There is a distinction between:

Fig. 17: time sequences and periods in reporting

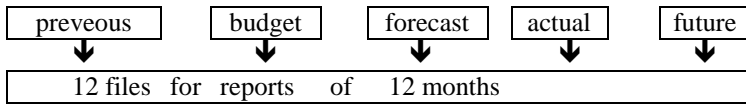
time sequences	periods
- <u>month</u> : Last full month data, referred to as the billing month.	- <u>previous</u> = past Past data for the selected time sequence. They are in particular from the previous year, but may also relate to earlier years.
- <u>year to date</u> : The financial year until the end of the billing month.	- <u>budget</u> = planning for the present Data planned in the past for the current billing period.
- <u>full year</u> : The entire financial year; also future months are included	- <u>forecast</u> = updated planning In particular quarterly revised using new data and lessons learned from updated budgets.
	- <u>actual</u> = billing period Actual data of accounting for the selected time sequence (see left).
	- <u>future</u> = planning for the future In the present for the future accounting period, in particular next year, planned dates.

(Source: W. Müller, Cost Accounting, Norderstedt 2012, p. 23)

This illustration introduces the terms budget and forecast, which in addition to the questions What? Where? and for what? Asks even the question When? The question of the "when?" has not yet been discussed and should be examined here. It is the central question of reporting and is also important for cost accounting. It can be distinguished as follows between time periods and periods, which only seemingly form synonyms.

Separate databases must be kept for the different periods of time, in which time periods are then delimited. The data flow and the necessary file structure can be displayed with the following chart:

Fig. 18: File structure of the reporting



(Source: W. Müller, Cost Accounting, Norderstedt 2012, p. 27)

Each of the files must have the same structure of cost elements and cost centres.

3.7.4. Activity Reporting

The reporting concentrates in the matter on the reporting of the areas of responsibility (where?) And the subject of the operational performance (for what?). The second question is presented as a segment report in annual reports according to international regulations. Previously IAS 14 differentiated into business segments (product groups) and geographical segments, which in turn could be built according to the location of the customers and the location of the permanent establishment or subsidiaries. With the introduction of IFRS 3, the geographical segments have been discontinued in segment reporting. IFRS 8 is now required for the segment report. Its contents are regulated in particular in IFRS 8.23.

It is also possible that the organizational structure of a company follows the Profit Centre Approach and divides the areas of responsibility according to the object principle (products) instead of the performance principle (activities). Then the reporting system would have to be structured according to areas of responsibility. For a matrix organization combining both the task and the

object principle, Cost Centre and Profit Centre Approaches are to be combined. The technical implementation can be carried out with the combined cost centre / cost unit number according to Fig. 15 on page 67, which can be done according to cost centre groups both for the execution principle with the first two digits, as for the object principle with the last three digits. The object principle will additionally incorporate the results of the BAB II.

But even with a classic expansion organization according to the performance principle, additional information about the various business units outside the segment report makes sense as feedback. For this, the periods according to Fig. 17 on page 70 should be compared not only with cost centres but also with cost units. Only the question of responsibility for a course correction would then have to be clarified in individual cases.

3.7.5. similarities and differences

Because of the limitation of a sheet of paper on rows and columns, which applies to a file accordingly, individual evaluations are patchy. A third dimension can still be taught with several evaluations (sheets of paper) in the same row-column format. However, the four dimensions of company data (see Section 3.7.1) can only be conveyed through a combination of several evaluations.

Responsibility reporting cannot report on cost units or activity reporting on cost centres. The profit centre structure, which defines the objects and

therefore the cost objects as cost centres, omits the analysis of the task fulfilment (question: where?). This is also followed by the segment report in quarterly and annual financial statements in according international standards.

The individual processed evaluations have the following information or gaps:

Fig. 19: Evaluations in comparison

Evaluation	sheet	Rows	columns	not included
Respons. Report	C'-Centres	C'-Types	time sequ.+ periode	C'-Units
BAB I	time sequence + periode	C'-Types	C'-Centres	C'-Units
Segment- Reporting	time sequence (only actual)	C'-Types	C'-Units	C'-Centres
Activity Report	C'-Units	C'- Centres	time sequ.+ periode	C'-Types
BAB II	time sequence + periode	C'- Centres	C'-Units	C'-Types
P/L - NoE P/L - FoE	time sequence (only full year)	C'-Types C'-Cent.	periode (act. + prev.)	C'-C., C'-U. C'-T, C'-U.

(Source: W. Müller, Cost Accounting, Norderstedt 2012, p. 33 -
The word "costs" was abbreviated for reasons of space with "C ")

But also the evaluations of the cost and performance calculation (BAB I + II), which do not perform a target / actual comparison, have a comparable presentation gap. Because only one sheet is created here for a selected period of time / period, there is only a two-dimensional representation. Here, the BAB II (lines: cost centres / columns: cost units) builds on the BAB I (lines: cost elements / columns: cost centres) in order to achieve a consideration of these

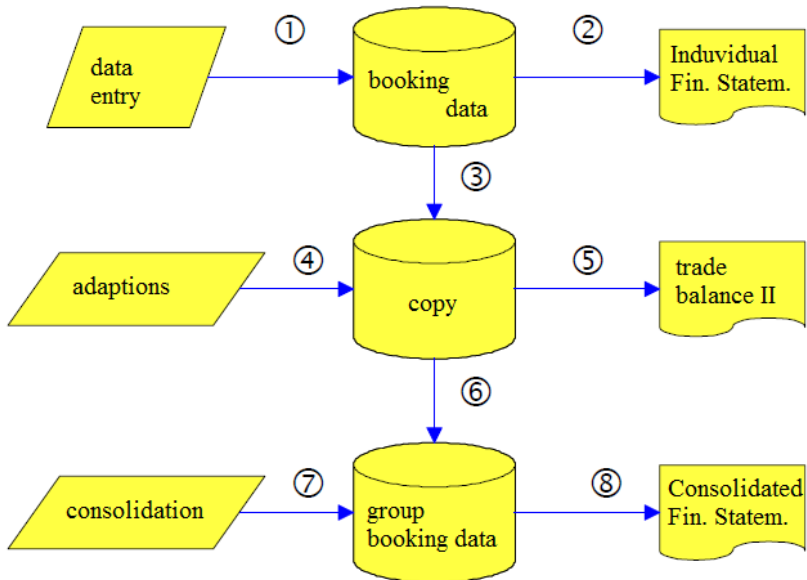
three dimensions. The income statement in the annual financial statements has two alternative representations. The total cost method according to Sect. 275 Abs.2 HGB makes a breakdown of the operating expenses by cost types; The cost of sales method according to para. 3 selects the cost centre classification. The company has to choose one of the two formats here.

The goal of feedback in the process of continuous improvement therefore does not demand the either-or-decision, but the both-and-also.

3.8. Group Accounting

Accounting 2.0 also creates more opportunities for groups of companies. The data from the accounts of the member companies can be transferred to an unofficial accounting database of the group, which can then produce its evaluations like those of a normal company. Based on the consolidation process (see Fig. 7 on page 30), this consolidated accounting is structured as follows:

Fig. 20: Group Accounting



Explanations:

- (1) In the regular accounting all documents are recorded.
- (2) The accounting data base forms the basis for the preparation of the individual financial statement.
- (3) The bookings that have been recorded are reported i.d.R. Copied once a month to a second database. The data transmission can be done with the deposit of a second account no. respectively. Thus, a group-wide chart of accounts for the consolidated financial statements can be used, whereby in the individual financial statements the group companies can continue to use their local chart of accounts. This is particularly necessary in countries such as France, Belgium or Spain, which require their companies to have a mandatory chart of accounts.
- (4) After each data transfer or at regular intervals, account maintenance must be carried out, which corrects postings that deviate from the standards of the consolidated financial statements or from group-wide policies.

- (5) This dataset forms the basis for the trade balance II. Like the separate financial statements, it is automatically generated from the accounts.
- (6) At the closing dates (ie quarters), the updated data is transmitted to the head office. In most cases, this transfer is limited to totals and balances of the individual months according to the group accounts. In the booking text, in the document no. or as a cost center, the transferring company is registered. All Group companies are then imported into a common database at the Group headquarters. The cost center as identification of the group company then has the advantage that the group headquarters can reproduce the trade balances II of each group company via the cost center module, which often spares queries to the group company.
- (7) Consolidations in the narrower sense (see Chapters 4 + 5) are recorded at the Group head office as adjustment entries. The posting documents can also be created according to the logic of the elimination method, in which each group company creates reports using the identification characteristic of intra-group transactions, which group-internal postings are contained in which accounts of the trade balance sheet II.
- (8) Consolidated accounting is the basis for the consolidated financial statements after the recognition of consolidation entries. It is automatically created from the accounts like the individual financial statement.

(Source: W. Müller, the consolidated financial statements according to IFRS, 2nd edition, Aachen 2005, p. 61 ff.)

If cost accounting is also to be consolidated by individual or all Group companies, the cost centre number in the booking file would not be available for the identification of Group companies. It would have to be either in the group accounting a new field for a company no. be created, or the cost center no. would have to be provided in the group with additional posts. Then the cost centre number in the group could be preceded by the company number.

A suggestion to solve the problem would be that the accounting programs in addition to account and cost centre (and possibly cost bearer) nor a project no.

create as a free allocation field. It could also be used during operation for spontaneous evaluations (projects) or e.g. in investment controlling for an inventory no. be used. That would be free in the group accounting in any case and could for a company no. be used.

3.9. The bookkeeping of branches

The consolidation of accounting can also occur in the opposite direction. A company can have several businesses that all want to create and evaluate their own data. However, the bookkeeping obligation exists for the company as a legal entity, ie for the sum of all enterprises. The company management also needs feedback at this level, even if the management of the individual companies also needs feedback for their level. However, this need could also be covered by responsibility reporting in a central accounting department.

If a decentralized company also decides on a decentralized accounting system, where the decentralized services are also settled on a decentralized basis and the customers' payments are made on the bank accounts of the branches, who make their purchases on-site locally and pay their suppliers' invoices themselves, then a decentralized accounting would be consistent. Unlike corporations, however, the transfer of individual records to a central accounting department would not only be an option but a legal obligation. The accounting obligation applies to the management. The store would in their view be just a data collection unit and a repository for receipts. From the perspective of the branch managers, however, the bookkeeping should be as

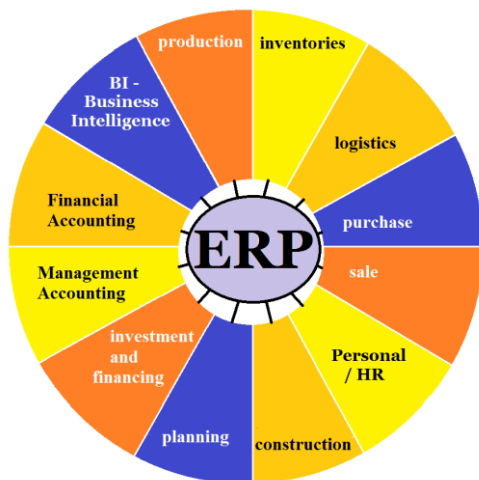
complete as possible, and therefore also have a partial balance sheet and a partial profit and loss account available for each branch.

From a technical point of view, it would be no problem to export recorded bookings to a file that is read in by the head office via an interface. Organizationally, one would have to agree on clear boundaries and deadlines in order to prevent coverage gaps and duplicate entries. To avoid such mistakes, it would also be necessary to create votes and controls.

A branch balance sheet would cover the local fixed assets, borrowed capital, own working capital and, in particular, cash holdings. For the initial preparation of such unofficial branch balance sheet, the balance would be the pro rata equity of the branch. This would be continued with the pro rata profits from a branch profit and loss statement.

For transactions with headquarters or other branches, clearing accounts would have to be kept, e.g. if short-term liquidity assistance is to be repaid later. There are no expenses and revenues between the companies. For this purpose, the highest special clearing accounts (for example, in equity) could be held, which cancel each other out. These clearing accounts should be closely monitored.

4. Accounting 3.0



4.1. System

The term "accounting 3.0" is in contrast to the two chapters previously somewhat problematic, because the approach is greatly expanded, was beyond an accounting in the strict sense. Much of the accounting 2.0 is also simply transferred and integrated into a larger context. In these parts the renewal does not go very far.

However, the name can be justified with the function of accounting as a navigation system of the company management. Just because the other elements are included in this navigation system is a new quality. At the name as accounting you should not bother then.

4.1.1. philosophy

Accounting is a model of the company. The model concept can be distinguished several times. Thus, e.g. Oldtimer miniatures, three-dimensional representations of a new construction project or also simulations of climate researchers as models called. These can still be distinguished in explanatory models and decision models, which the o.g. Examples can clarify. The classic car miniature is an explanatory model because it illustrates the appearance of a car of the past. By contrast, the presentation of a new building project serves as a decision model for the presentation of the future. Several variants of the future can be compared with it to decide for the best. Models do not have to be real, but like the climate model, they can also be virtual. Virtual models, as

combined models of explanation and decision making, can explain the causes of observations of the past and, on this basis, simulate future developments (for example by reducing CO₂ emissions). Thus, these models serve to select the decisions that promise the most favorable development in the future.

There is a tendency to constantly refine the models. This also applies to the model representation of the company, which was previously a virtual number model of financially relevant sizes. Even at the time of Pacciolli, however, it was possible to distinguish between the working level and the evaluation level in accounting. The preparation of evaluations was tedious and so dominated the provision of data for daily business. At the working level, the data was generated that was used at the evaluation level. With the use of EDP many evaluations were constantly available. The evaluations could be carried out at ever shorter intervals. At the same time, the working level was more efficient.

Against this background, all operational processes are to be recorded today. The accounting is to be expanded to the memory of the company. As in human memory, a distinction must be made here between important and unimportant. Therefore, the operational processes must first be known. This then recognizes the information that fits into these processes as important.

With the extension to the whole company, goals are also controlled with the procedure from Fig. 12 on page 63, which do not have to pursue any economic goals. This allows the company to set environmental goals and set up a reporting system to control the achievement of this plan.

The graphic on the front page for this chapter says that many of the organizational and technical tools that do the hands-on work flow into the ERP.

The graphic names the task areas:

Business Intelligence	Production	Supplies
Logistics	Purchasing	Sales
Personnel / HR	Construction	Planning
Investment and Finance	Controlling	Accounting

There are own software solutions here. They are coordinated in an ERP system so that data can be transferred to other applications and all information from all applications can be viewed everywhere. Of course, with authorization codes, access can also be restricted for security reasons.

4.1.2. volumes and amounts

A major change compared to the accounting 1.0 and 2.0 is the consistent combination of volume and monetary units, as long as it cannot be in terms of financial assets, as in the case of claims, liabilities and means of payment. But even here, inflation could be eliminated by using units of measure. In the operative business, only the quantity unit is usually important. Procurement is about units of measurement of a variety of input factors that need to be in the right place at the right time. In production, the planned quantity is to be produced in the planned time, for which delivery dates may have already been agreed with the customers. Also in sales it is in the sales targets, so again by units of measure. If they are not reached, the whole operation suffers from underutilization.

Accounting 3.0, which intends to integrate all operational functions in ERP, must meet these requirements. At the same time, however, it can also automatically evaluate the quantities ($\text{quantity} \times \text{value} = \text{amount}$) and increase the awareness of the persons involved in the economical use of resources.

4.1.3. past and future

The companies are not led in the past, but in the present with a focus on the future. The data on which the company management can rely, however, comes from the past. It is therefore the concern of Accounting 3.0, to generate data for the future.

The available data is initially recorded in quantity and monetary units for past and future. The units of measure can be entered directly or derived from the amounts. Both methods can be combined depending on the nature of the processes. The future is derived from the past. The procedure can be represented as follows, where the italicized words are for entering data:

Fig. 21: Past and future

	monetary units	price	units of measure
past			
direct	<i>amount according to accounting</i>	amount : quantity	<i>statistics</i>
or			
derived	<i>amount according to accounting</i>	<i>index value</i>	amount : price
future	quantity \times price	past \times index	past \times expectation

(Source: own illustration)

For the past, statistics on consumption, production and sales volumes are needed in addition to the amounts from accounting. If it does not make sense to carry differentiated statistics for individual consumption quantities, the level of purchase prices can be observed and the price development can be expressed in a price index. The derived artificial consumption quantities are then the consumptions based on the prices of the year in which the system was introduced. The values of the future are then an extension of the past. For the units of measure, an expectation must be formed, e.g. because a planned increase in the sales pays also mean higher production and then higher consumption.

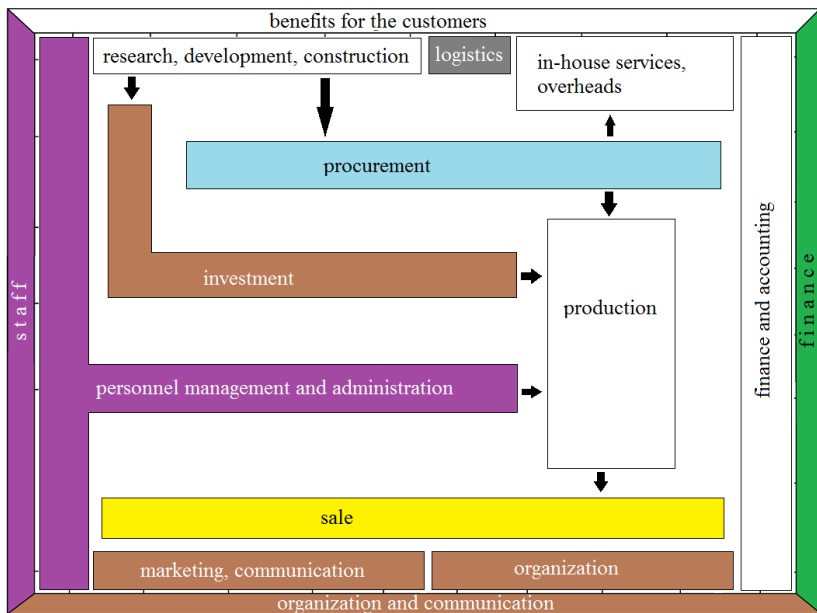
4.1.4. Enterprise Ressource Planning (ERP)

The implementation of accounting 3.0 in companies is often a job creation program for management consultants. Software vendors only sell their programs and companies are overwhelmed with their setup. The consultants, however, know the possibilities of the software, but not the processes in the companies. In the end, the introduction of ERP systems causes high costs and does not bring the desired results.

An alternative possibility would be to set up an ERP system for a fictitious sample company. Companies could then copy this proposal and adapt it to their needs. In many cases, texts would have to be changed. Rarely, completely new processes would have to be set up, which would not have been provided by the model organization. If there were many different sample organizations for

different industries, company sizes and legal forms, the fit would be comparable to ready-to-wear clothing, which will easily be worn by the masses of the population. This idea is to be deepened in this chapter. The following figure refines the rough representation and prepares it for the ERP concept:

Fig. 22: Value added and ERP



(Source: own illustration)

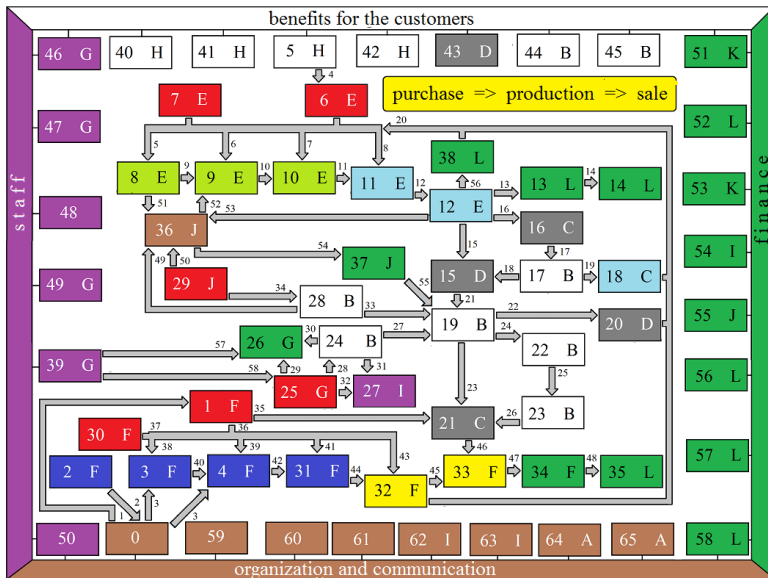
In Fig. 1 on page 8, the value creation process was roughly presented. Potentials and repeating factors (= investments and current purchases) are recombined in the production of products and sold, whereby the production factor of labor in this process is incorporated and the use of capital makes it possible.

The individual rectangles are divided into different tasks. They are more or less networked with other tasks. This breakdown and networking is the subject of the remaining description of this chapter. It can be understood as a catalog of requirements, which should be considered when programming. The processes in industrial companies form the mental background. But they are also transferable to other industries.

4.1.5. Technique of description

The breakdown of Fig. 22 on page 85 can be done as follows, which requires explanation.

Fig. 23: Networking of tasks and functions

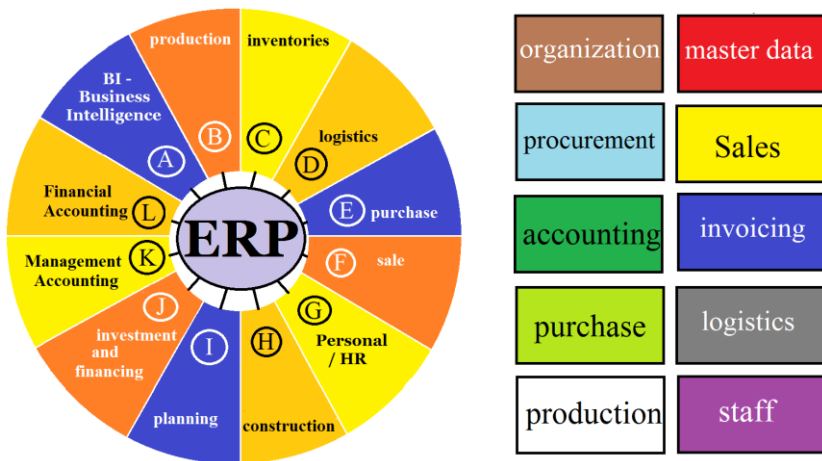


(Source: own illustration)

This graphic and the following explanations describe the division of labor and information flow in a company that is similar regardless of the specific products and the industries.

The letters in the rectangles of Fig. 23 on page 86 result in an assignment to the various functions of an ERP system according to the circle shown on the left; The colors used for the rectangles have the meaning given in the rectangles on the right of Fig. 24.

Fig. 24: Explanation of Fig. 23



(Source: own illustration)

The numbers of the rectangles in Fig. 23 on page 86 refer to the sections of the following sections. The number is shown in brackets at the end of the title. These sections also explain the arrows, which are also numbered.

4.2. sales market

Companies earn their living by selling a benefit to customers when selling prices are higher than unit cost. Customers buy the products if they value the benefits higher than the price. Companies and customers therefore share the difference between benefits and unit costs. The division need not be the same or fair. However, a too one-sided distribution would mean that the difference is too small for the customer and they prefer to buy other products for their limited income. Conversely, too little profit would mean that companies would no longer offer these services and that customers would have to look for an alternative.

4.2.1. Marketing (0)

The marketing was formulated as point zero, because here the value creation has its starting point. In terms of color, this function is marked as an organizational task. Even the best benefit must first be sold to the customer. Since companies have sufficient competence to be able to offer their customers sufficient benefits at reasonable costs, the company's added value is based on communication with potential customers.

In a high-tech economy, companies mainly incur fixed costs that are not directly dependent on capacity utilization. With a larger workload, you can spread those costs to a larger amount, reducing unit costs. Of course, the increase in capacity also causes higher fixed costs, so in a broad sense, there is

also a connection. Nevertheless, it is advantageous to use the size-dependent cost advantages, which is why always a minimum size must be achieved. For this purpose, the textbooks suggest a market-oriented corporate governance, which is described in the following table:

Fig. 25: Market-oriented corporate governance

Aspects	Content	Tasks / Questions
Philosophy	target company on wishes and needs of customers	create value, be credible, core competences in focus
Information	exploration of the market	size, competition, market share
Segmentation	decompose market by target groups	e.g. delimit Discout : Premium
Behavior	conclusions fr. analysis of customers and competition	seek market niches; offer what is not / better or cheaper
Strategy	long term. Behavior plan	Reliability for customers
	select market	serve the specific segment
	setting of accents	be better? be cheaper? be different?
Aktion	Product Policy	Product Properties / quality
	price policy	good value for money
	Distribution policy	distribution channels
	Communication policy	mainly advertising
coordination	organizationally	Implementing in the company
Socialization	Arrange in society	Unternehmen will wahrgenommen werden

(Source: in extension of: H. Meffert, B. Burmann, M. Kirchgeorg, fundamentals of market-oriented enterprise management, 9th ed., Wiesbaden 2000, P. 8, from the 10th edition transformed)

The marketing policy as content of the aspect "action" is of particular importance. Every business is defined by the benefits it offers its customers and the products that it designs. The core of this orientation to the customer is the marketing policy. It is divided into

Product policy	characteristics and quality,
Pricing policy	high or low, in inverse relation to quality,
Distribution policy	by which route the product comes to the customer,
Communication policy	Advertising and other tools.

The product policy also has to decide which products should be offered. This also defines the concrete characteristics and above all the price requirement, which is administratively recorded in the master data. (Arrow 1)

The marketing policy is based on the relevant sales market, which should be illuminated with a market research. (Arrow 2) The delineation can still be based on objective criteria in terms of customer benefit, but also with a segmentation (aspect of market-oriented corporate governance according to Fig. 25 on page 89).

The aim of marketing is to attract customers, and especially regular customers who are satisfied with the performance and buy the products over again. But also the acquisition of new customers, who should become as regular customers as possible, is important. They should be motivated to approach the company with their wishes in a concrete inquiry. (Arrow 3)

Advertising as part of communication policy plays a key role in attracting customers. It must not contradict the other procedures. The product features that are advertised must also be present. That must be coordinated with the technology (function 5 - construction).

Especially the price and product policy as content of the aspect "action" must be supported with data. In addition to market research, this should primarily provide the cost and benefit accounting from internal accounting. A success control of advertising would be useful; but she is difficult. Nevertheless, in order not to cause useless costs, a goal should be formulated for each advertising measure. Subsequently, the search should be made for the data from which the achievement of the goal could be read. Thereafter, it should be noted to what extent these data have changed.

4.2.2. Master data of sold goods (1)

Master data must be defined for the product program. As a unique identifier is an article no. forgive. These include a short description of the article, possibly a more descriptive long description, size / weight, and in particular the required prices. Other features may be useful in individual cases. In addition to electronically stored data of the goods master data should under the article no. also the technical documentation of the goods, the history of the development of the product, previous advertising activities and possibly reactions in the media are archived. These are not master data in the narrow sense, but also no transaction data. This additional information can be digitized; because they are not needed in day-to-day business, nothing speaks against analog archiving.

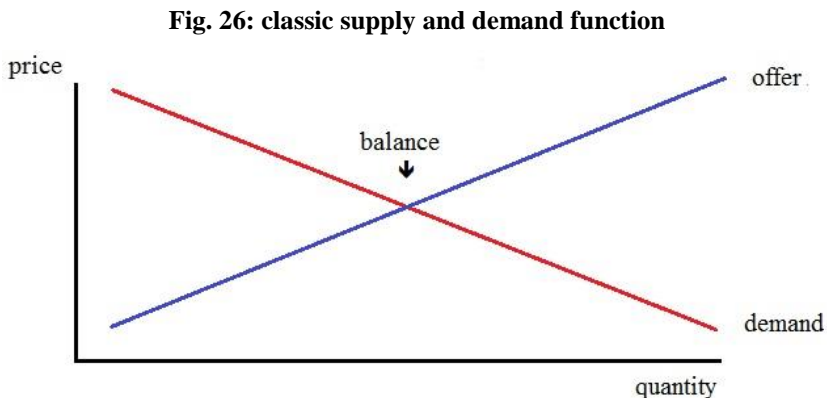
Under the item no. Sales and turnover figures should also be found and it should be noted how much profit was generated, even if the distinction to other

products is often difficult. The article master data should then be defined so that the necessary background for understanding the current transaction data can be called up at any time.

4.2.3. Sales Market Research (2)

Sales market research serves to understand the behavior of current and potential customers. This includes knowledge of the economic context. Nevertheless, the function is assigned to the sales color.

Recognizing that supply and demand dominate prices has been one of the key messages in economics since the book by Adam Smith in 1776, "An Inquiry into the Nature and Causes of the Wealth of Nations." After that, supply and demand have been presented for generations with the following graphic:

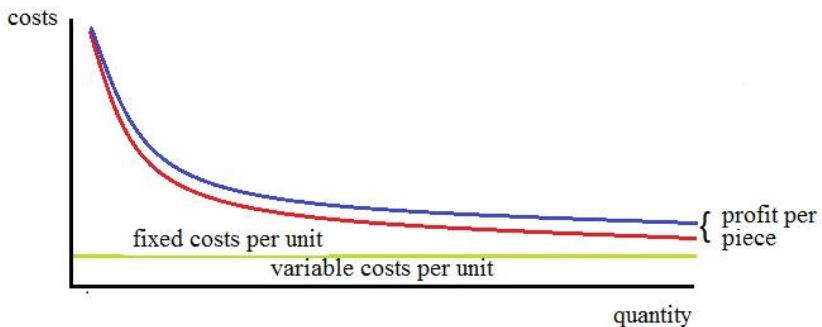


(Source: <https://mueller-consulting.jimdo.com/research/subjects/offer-demand/>)

This model is based on many small suppliers and many small buyers. The increase in volume at higher prices is achieved by the fact that then more suppliers (according to the idea of Smith, for example, small craftsmen) manufacture these goods. These assumptions are no longer in the ordinary range today. The mechanism still works a little bit, but mostly not as described by Adam Smith.

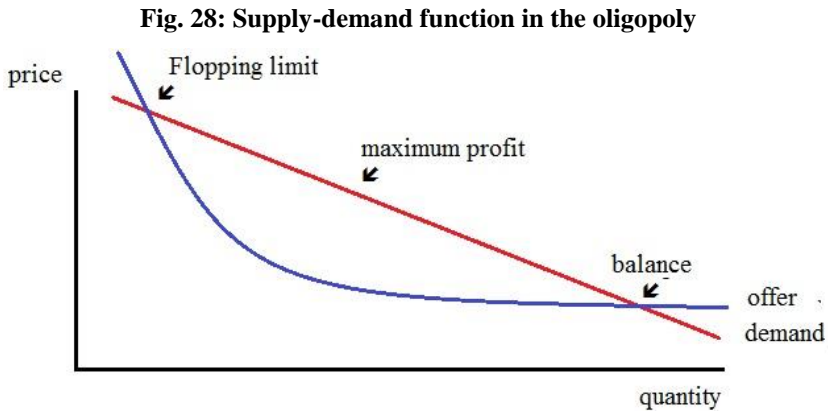
Smith distinguished the market price, formed by supply and demand, from the natural price, which coincides with the average cost (wage, land rent and profit). The market value fluctuates around the natural value, but in the long run can not move far away from it. Under the conditions of industrial production with few large suppliers, this means that with increased demand and larger quantities produced, the unit costs decrease due to the effect of fixed cost depression, as shown in the following graph:

Fig. 27: Cost function



(Source: <https://mueller-consulting.jimdo.com/research/subjects/offer-demand/>)

Now, if you assume like Adam Smith, that demand will increase linearly with falling prices and the natural price declines with costs, then the following supply and demand function will occur:



(Source: <https://mueller-consulting.jimdo.com/research/subjects/offer-demand/>)

The function would not have one, but two intersections. In a demand below the first intersection point, referred to here as the flop limit, the cost of the provider is not covered. This product would not be offered. The intersection of supply and demand comparable to classic graphics would be second. However, this would probably only be achieved under the conditions of a price war if stronger suppliers with lower costs wanted to oust a competitor from the market. More often, however, they are likely to seek a profit maximum, where they would achieve even high profits and the weaker competitors low profits. Under these conditions, the market price would therefore be well above the