

## Medieval Accounting

The thousand years between the fall of the Roman Empire and the publication of Luca Pacioli's *Summa* are widely viewed as a period of accounting stagnation, and medieval practices outside Italy are often ignored in historical summaries. Yet, as historian Michael Chatfield has observed, medieval agency accounting, "laid the foundations for the doctrines of stewardship and conservatism, and the medieval era created the conditions for the rapid advance in accounting technology that occurred during the Renaissance."

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While accounting under the Roman Empire was prescribed by the centralized legal codes of the time, medieval bookkeeping was localized and centered on the specialized institutions of the feudal manor. The systems of exchequer and manor necessitated numerous delegations of authority over property from the owners to actual possessors and users. The central task of accounting during this era was to allow the government or property owners to monitor those in the lower portions of the socio-economic "pyramid."

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When William the Conqueror invaded England, he took possession of all property in the name of the king. In 1086, he conducted a survey of all real estate and the taxes due on them, known as the *Domesday Book*. The oldest surviving accounting record in the English language is the Pipe Roll, or "Great Roll of the Exchequer," which provides an annual description of rents, fines and taxes due the King of England, from A.D. 1130 through 1830.

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Compiled from valuations in the *Domesday Book* and from statements of sheriffs and others collecting for the royal treasury, the Pipe Roll was the final record on parchment of a "proffer" system which extensively used a wooden stick as a basis of account-keeping. Twice a year, at Easter and Michaelmas (September 29), the various county sheriffs were called before the Exchequer at Westminster. At Easter, a sheriff would pay about half of the total annual assessments his county owed. In accepting a sheriff's payment on account (the proffer), the treasurer would have a wooden tally stick prepared and cut as a record of the transaction.

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Used even before the introduction of the Pipe Roll, the tally stick was a nine-inch long, narrow, hazelwood stick, cut with notches of varying size to indicate the amount received. A cut the size of a human hand was 1,000 pounds; a thumb's width, 100 pounds; a cut the thickness of a "grain or ripe barley," one pound; and a shilling, just a notch.

Chatfield describes the way in which the tally stick was used to make a receipt in an age when few could read or write: After the amount of the sheriff's proffer had been carved, a diagonal cross cut was made an inch or two from the thicker end of the tally, and the whole stick was split down the middle into two identically notched parts of unequal length. The flat sides of both pieces were inscribed in Latin to show that they related to the same debt, and as additional protection, the cross cuts were made at various angles on different tallies, so that no "foil" or shorter piece could possibly be fitted to any "stock" but its own. The sheriff then departed with the stock as his receipt for payments rendered, and the foil was kept by the treasurer for the Exchequer archives.

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At Michaelmas, each sheriff returns for the final accounting, at which he pays the whole year's revenues. The treasurer reads the amount due from the Pipe Roll, and the sheriff must justify any unusual expenses claimed. Final settlement occurs at a table covered by a checkered cloth, for which the Exchequer is named. "Counters" are placed on the squares to visually represent the amount due the king from that county. Another row of counters represents the Easter payment, which is verified by fitting together the sheriff's tally stock with the Exchequer's foil to demonstrate that the notches and cuttings correspond.

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## Italian Renaissance: Birth of Double Entry

The innovative Italians of the Renaissance (14th -16th century) are widely acknowledged to be the fathers of modern accounting. They elevated trade and commerce to new levels, and actively sought better methods of determining their profits.

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Although Arabic numerals were introduced long before, it was during this period that the Italians became the first to use them regularly in tracking business accounts – an improvement over Roman numerals the importance of which cannot be overstated. They kept extensive business records, as the use of capital and credit on a large scale developed: The evolutionary trend toward double entry bookkeeping was underway.

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## Luca Pacioli And The Summa

Luca Pacioli was a true Renaissance man, with knowledge of literature, art, mathematics, business and the sciences, at a time when few could even read. Born about 1445 at Borgo San Sepulcro in Tuscany, Frater Luca Bartolomes Pacioli acquired an amazing knowledge of diverse technical subjects – religion, business, military science, mathematics, medicine, art, music, law and language. He accepted the popular belief in the inter-relatedness of these widely varying disciplines and in the special importance of those, such as mathematics and accounting, which exhibit harmony and balance.

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His friend Leonardo da Vinci helped prepare the drawings for Pacioli's 1497 work, *Divina Proportione*; In turn, Pacioli is reputed to have calculated for da Vinci the quantity of bronze needed for the artist's huge statue of Duke Lidovico Sforza of Milan.

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Around 1482, after completing his third treatise on mathematics, Pacioli, who like many of his time sought preferment as a teacher, became a Franciscan friar. He traveled throughout Italy lecturing on mathematics, and, in 1486, completed his university education with the equivalent of a doctorate degree.

Pacioli never claimed to have invented double entry bookkeeping. Thirty-six years before his monumental treatise on the subject, Benedetto Cotrugli wrote *Delia Mercatura et del Mercante Perfetto (Of Trading and the Perfect Trader)*, which included a brief chapter describing many of the features of double entry. Although this work had not been published for more than a century, Pacioli was familiar with the manuscript and credited Cotrugli with originating the double entry method. 5

Pacioli was about 50 years old in 1494 – just two years after Columbus discovered America – when he returned to Venice for the publication of his fifth book, *Summa de Arithmetica, Geometria, Proportioni et Proportionalita (Everything About Arithmetic, Geometry and Proportion)*. It was written as a digest and guide to existing mathematical knowledge, and bookkeeping was only one of five topics covered.

The *Summa's* 36 short chapters on bookkeeping, entitled "De Computis et Scripturis" ("Of Reckonings and Writings"), were added, "in order that the subjects of the most gracious Duke of Urbino may have complete instructions in the conduct of business," and to, "give the trader without delay information as to his assets and liabilities." (All quotes from the translation by J.B. Geijsbeek, "Ancient Double Entry Bookkeeping: Lucas Pacioli's Treatise," 1914). 10

Perhaps the best proof that Pacioli's work was considered potentially significant, even at the time of publication, was the very fact that it was printed on November 10, 1494. Gutenberg had, just a quarter century earlier, invented metal type, and it was still an extremely expensive proposition to print a book. 15

### **Pacioli's System: Memorandum, Journal and Ledger**

"De Computis" begins with some basic instruction for commerce. The successful merchant, declares Pacioli, needs three things: sufficient cash or credit, good bookkeepers and an accounting system which allows him to view his finances at a glance. Before commencing business, one should prepare an inventory listing all business and personal assets and debts. This inventory must be completed within one day, and property should be appraised at current market values and arranged according to mobility and value, with cash and other valuables listed first since they are most easily lost. 20

The memorandum, or memorial, was Pacioli's equivalent of a daybook, for the recording, in chronological order, of business transactions as they occurred. The transaction could be entered in any of the various monetary units then in use in the Italian city-states of the time, with conversion to a common currency for double entry left for later. 25

The journal was the merchant's private account book. Entries consisted of a narrative debit, credit and explanation in one continuous paragraph. The journal had only one column, which was not totaled. There were no compound entries. Pacioli's ledger was, of his three books, the most like its modern equivalent. The money and date columns were almost identical to those in modern ledgers, with entries consisting of brief paragraphs, debits on the left side of a double page (*deve dare*) and credits on the right (*deve avere*). 30

The bookkeeper posts "cash in hand" as a debit on page one of the ledger, just as it was entered first in the journal. As ledger postings are made, two diagonal lines are drawn through each journal entry, one from left to right when the debit is posted and the other from right to left when the credit is posted.

The first 16 chapters of "De Computis" describe this basic system of books and accounts, while the remaining 20 are devoted to specialized accounting issues of merchants. These include bank deposits and withdrawals, brokered purchases, drafts, barter transactions, joint venture trading, expense disbursements and closing and balancing books. 35

The trial balance (*summa summarium*) is the end of Pacioli's accounting cycle. Debit amounts from the old ledger are listed on the left side of the balance sheet and credits on the right. If the two totals are equal, the old ledger is considered balanced. If not, says Pacioli, "that would indicate a mistake in your Ledger, which mistake you will have to look for diligently with the industry and intelligence God gave you." 40

### **Significance of the Summa**

In the first century after its publication, the *Summa* was translated into five languages, and numerous books on double entry bookkeeping appeared in Dutch, German, English and Italian whose descriptions were obviously lifted from "De Computis." Many consider these works inferior explanations of the system so clearly articulated by Pacioli. 45

One historian has described the works issued during this period as, "at the best, revisions of Pacioli, at the worst servile transcriptions without even the courtesy of referring to the original author." Nevertheless, they helped quickly spread the knowledge of the "Italian method" throughout Europe.

Perhaps most surprising is how little bookkeeping methods have changed since Pacioli. Both the sequence of events in the accounting cycle and the special procedures he described in "De Computis" are familiar to modern accountants. In fact, the primary differences between current bookkeeping practices and the "Method of Venice" are additions and refinements brought about by the needs of a larger scale of business operation. 50

The small proprietorships of 15th century Italy had no need for specialized journals, subsidiary ledgers, controlling accounts, formal audit systems, cost accounting or budgeting. Some omissions, such as the failure to touch on accruals and deferrals, probably occurred because Pacioli felt they were too advanced for a beginner's treatise. But numerous tiny details of bookkeeping techniques set forth by Pacioli were followed in texts and the profession for at least the next four centuries, as accounting historian Henry Rand Hatfield put it, "persisting like buttons on our coat sleeves, long after their significance had disappeared." 55