
ARTÍCULOS DOCTRINALES / ARTICLES

**VENETIAN 15TH CENTURY BOOKKEEPING AS TAUGHT BY
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Abstract: This paper presents an overview of the only known Venetian manual on double entry bookkeeping that predates Pacioli's *Particularis de Computis et Scripturis*: de Raphaeli's *La Riegola de Libro*, or *The Rules of Bookkeeping*. Written in 1475, it was lost until 1989, escaping the attention of Fabio Besta, Vincenzo Vianello and others in the 19th and 20th centuries who desperately sought to disprove Pacioli's authorship of his treatise. Had they found it, a different history would be told, but would Pacioli's place have been usurped? This study considers the purpose behind de Raphaeli's instructional manual; its content; what it tells us about how Venetian wholesale merchants did their bookkeeping in the 15th century; and about how bookkeeping was taught by tutors before Pacioli removed the need for a tutor in 1494.

Keywords: *Raphaeli, double entry bookkeeping, accounting education, bookkeeping manual, medieval tutor*

**LA CONTABILIDAD VENECIANA DEL SIGLO XV ENSEÑADA POR
MARINO DE RAPHAELI**

Resumen: Este artículo presenta una descripción general del único manual veneciano conocido sobre contabilidad por partida doble que es anterior a *Particularis de Computis et Scripturis* de Pacioli: *La Riegola de Libro*, o *Las reglas de la contabilidad de de Raphaeli*. Escrito en 1475, se perdió hasta 1989, escapando a la atención de Fabio Besta, Vincenzo Vianello y otros en los siglos XIX y XX que buscaron desesperadamente refutar la autoría de Pacioli de su tratado. Si lo hubieran encontrado, se contaría una historia diferente, pero ¿habría sido usurpado el lugar de Pacioli? Este estudio considera el propósito detrás del manual de instrucciones de de Raphaeli; su contenido; lo que nos dice acerca de cómo los comerciantes mayoristas venecianos llevaban la contabilidad en el siglo XV; y sobre cómo los tutores enseñaban contabilidad antes de que Pacioli eliminara la necesidad de un tutor en 1494.

Palabras clave: *Raphaeli, teneduría de libros por partida doble, educación contable, manual de teneduría de libros, tutor medieval*

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Introduction

Until the 1989, a 15th century 36-page instructional manual on Venetian double entry bookkeeping lay undisturbed in the National Library of Malta. It had been there for over 140 years and had been on the island since at least 1756, when it was acquired by a Jesuit priest and bibliophile, Dun Ignazio Saverio Mifsud (1722 – c.1773). One reason why the manual went unnoticed for so long is because it is bound in one volume at the back of a manuscript edition of Benedetto Cotrugli's (1458) *Libro de Larte dela Mercatura* [The Book of the Art of Trade].¹ Cotrugli's book was recently transcribed using all four surviving editions, of which this is the earliest (Ribaud, 2016) to create a 'master' version, which was then translated into English (Carraro & Favero, 2017). For obvious reasons, that project did not include de Raphaeli's bookkeeping manual: Cotrugli was not the author. This paper presents an overview of that manual.

The absence of any awareness of the existence of de Raphaeli's manual has led accounting historians, scholars, and many practicing accountants to attribute the development of modern accounting to Luca Pacioli because he published the first printed manual of instruction in double entry in 1494. Pacioli certainly influenced practice and instruction in double entry in a way that has survived for over 500 years, but the real catalyst for the adoption of the Venetian method as the core of modern accounting are the bookkeeping tutors of the 15th century. Of them, we only know of one: Marino de Raphaeli (Sangster, 2018). De Raphaeli appears to have influenced Pacioli, who made use of a similar style of introductory tuition in double entry. In addition, many of his examples resonate with examples of de Raphaeli. Our debt as a discipline therefore, arguably lies not so much with Pacioli as with de Raphaeli.

Marino de Raphaeli

We know very little about Marino de Raphaeli. He prepared the copy of Cotrugli's manuscript that is bound at the front of the bookkeeping manual and identified himself as Ragusan when he signed the end of that manuscript. Ragusa (Dubrovnik) had been under Venetian suzerainty² between 1205 and 1358, when Dalmatia, of which Ragusa was one of the principal towns, came under the suzerainty of Hungary. In 1420, Venice purchased Dalmatia. However, despite the close ties to Venice, Ragusa remained independent.³ Unsurprisingly given the period of Venetian influence, de Raphaeli wrote in Venetian dialect and used the Venetian method of double entry. Many variants of his own name appear in the manual, exhibiting the mind of a teacher trying to compartmentalise instruction for his student or, perhaps because these were real people

¹ A facsimile edition of *Libr. XV* was published in 2014 (Sangster, 2014).

² Suzerainty is a relation between states in which a subservient nation has its own government, but is unable to take international action independent of the superior state.

(<https://www.yourdictionary.com/suzerainty>)

³ For a brief history of Ragusa, see https://en.wikipedia.org/wiki/Republic_of_Ragusa; <https://www.britannica.com/place/Dalmatia>; <https://www.britannica.com/place/Dubrovnik>

(van der Helm and Postma, 2000). If the latter was the case, he may have been in his early 30s when he wrote the bookkeeping manual.

The bookkeeping manual reveals a maturity in the Venetian method of double entry that might surprise anyone who thought it only reached maturity after Pacioli printed his treatise. De Raphaeli makes it clear that the journal is the first step and is used to make entries in the ledger. The earliest known surviving example of a paired Venetian journal and ledger are those of Andrea Barbarigo (1418-1449). De Raphaeli's manual could have been written using Barbarigo's journal as the source for the entries, or any other contemporary journal that has not survived. Many of the names de Raphaeli uses are of real people, real banks, real businesses. It was a manual written to teach a member of a wealthy family how to do the bookkeeping for the family business – who else could afford the services of a scarce and expensive bookkeeping tutor? If more than a few existed, we would have evidence, they would be mentioned in correspondence, account books, wills, and testaments. We have none from those sources, only de Raphaeli.

Where did the Venetian method come from? Who thought of the idea of a journal that summarised every transaction and was then used as the source for each and every entry in the ledger? The Tuscan's certainly did not. Did the Venetian merchants? None did that we know of, including Barbarigo, who observed the practice of entering in the journal the location of the two ledger accounts for each entry in the journal, but did not maintain his journal in chronological order so working back from ledger to journal looking for an entry was such that “*we cannot be sure it is not somewhere out of chronological order*” (Lane, 1944, p. 162). It seems that the Venetian method as presented by de Raphaeli was a normative method, in the sense of desirable – one that should be used – but one that practice struggled to adhere to. It was also the method presented by Pacioli as *el modo de Venegia*, and then as *libro doppio* by Tagliente (1525), and as *libro doppio* by Manzoni (1540), and all the other tutors who published manuals over the following century. It seems that the Venetian method was an ideal, but flawed in practice in the 15th century. Perhaps, it was only because the tutors taught and wrote about the ideal that it eventually become the norm many years later.

The family for whom de Raphaeli dictated his manual to his pupil (Sangster, 2015) – also paid for a copy to be made of Cotrugli's *Art of Trade*. Together they represented a significant investment in the future of a young man about to enter the family business. His name was Zuan de Domenego. We know nothing about him, other than that he was a member of one of the major families of Venice, well-connected, and with the financial backing to embark on the type of business activities described in de Raphaeli's manual. It is thanks to this commission by the family and the binding together of both these manuscripts in one volume that de Raphaeli's manual has survived. Four pages are missing, most likely having been removed at some point because they were about domestic accounting – household accounting, marriage accounting, and dowry accounting. We shall never know but, compared to the manuals of the 16th century tutors, Tagliente and Manzoni, these topics are noticeably absent from de Raphaeli and a good fit for the four missing pages (ibid.).

The Rules of Bookkeeping

Marino de Raphaeli's manual has no title, but it begins with the statement, *Questa sie la riegola de libro, la qual sie fondamento de ogni quadernier* – These are the rules of

bookkeeping that are fundamental to any bookkeeper. The surviving 36 pages present a rich mixture of business practice of a merchant who is involved in import and export, slavery, silk manufacture, building construction, merchandise accounts, and the necessary financial medium for many businesses of that time, bills of exchange. It is a statement of the variety of business practice, the vagaries of commerce, the manipulation of bills of exchange to make money. Above all, it is an exemplar of how to keep a double entry journal in the Venetian style.

In that respect it is unambiguous and constant in the format to adopt, mirroring the journal of Andrea Barbarigo in its presentation, and embracing *el modo de Venegia* that was later captured in print by Luca Pacioli (1494). This was Venetian double entry as it should be practised. There are flaws – the dates become confused where Marino de Raphaeli has failed to update them from an earlier assignment and Zuan de Domenego is particularly weak at arithmetic in the first half of the manual – but the method of double entry is clearly defined and presented. As a first course in double entry for the journal, it is hard to fault. What it lacks in complexity would soon be encountered in practice and solved by his pupil armed with the basics from de Raphaeli's manual. On the subject of this lack of complexity, it is no less the case in all the manuals printed into the 17th century, in fact, arguably more so. They covered the basics but they did not get as close to the complexities of business practice that is to be seen in the account books of the 14th to the 17th century. All these manuals contained the maxims (Polanyi, 1958, pp. 51-64; 1966, pp. 4-7) of double entry – what can be taught. Practical knowledge and experience was needed to take the learner to the next level, and he would learn that 'on the job'.

The content of de Raphaeli *Rules of Bookkeeping*

Table 1 presents the syllabus covered in the manual.

Section ⁴	Cartas ⁵	Began	Merchant	Topics	J/Es	
I	101v-102r	Dec 19	Rafael de Nicolò	General instructions, <i>aventario</i> and its journal entries	7	
II	102v-105v	Mar 1	Rafael (presumably the same person)	Entries of another <i>aventario</i> , purchases, sales	57	
III	105v-106v	Apr 11		Buying/selling for account of another	21	
IV	107r	May 4		Voyage to Beirut, commissioned to someone	8	
V	107v	16		<i>Camera d'Imprestedi</i> (Government Bonds)	8	
VI	108r	June 6	Rafael de Marin	Partnership, with voyage <i>in persona</i> to the Levant	8	
VII	108v-109r	14		Voyage to Alexandria, commissioned to someone: purchases, etc. 109r shipping	6 6	12
VIII	109v-111v	Aug 1	Marin de Rafael ⁶	Partnership, with voyage <i>in persona</i> : purchases, etc. 110v-111v shipping, conduct business by barter in several seaports	15 16	31
IX	112r-115r	Sep 4	Zuan Domenego	Partnership of a 'silk shop', with complete cycle from formation to selling the finished products	55	
X	115v-116r	Oct 1		Construction of a building	18	
XI	116v	14		Let of houses, bad debts, and the <i>decima</i>	9	
	117 & 118 missing					
XII	119r-120r	29		Bills of exchange (with <i>protesto</i>) and some instruction	23	
XIII	120v-121r	Nov 2		Maritime insurance and some additional instructions regarding maritime insurance, voyages and balancing the ledger	10	
					267	

Table 1. The contents, number of journal entries, and changes of 'owner' in the manuscript. [Sources: van der Helm & Postma (2000, p. 174); Sangster (2015), amended by the author.]

The basics of double entry

The first two chapters deal with generic aspects of double entry. The way entries are prepared in the journal, and in the ledger, are briefly described and then the focus is on

⁴ Section numbers have been added. They are not numbered in the manuscript.

⁵ A carta is a sheet of paper representing two pages, one on the front and the other on the back. Carta 102r is the right-hand page in an open book. 102v is on the back of that page, i.e., it is the left-hand page you will see if you turn over page 102r. The pages in the manuscript are numbered in cartas on the right-hand pages.

⁶ The Italian equivalent of this name, which is in 15th century Venetian dialect, is Marino di Raffaele or, because spelling had not yet become consistent, Marino de Raphaeli.

how to make entries, firstly of what is being introduced into a new business by the owner and then, in Section II, entries for purchases and sales.

Section I is very similar to Tagliente's (1525) introduction. At the foot of the first page is an *aventario* of the merchant's capital (*aventario del mio chavedal*). This is then used to make the first entries in the new journal. While this reveals an awareness that the difference between the debits and the credits represents the merchant's capital, it was not in any way what we would consider either a trial balance or a balance sheet. No indication is given by de Raphaeli of where the *aventario* was to be written.

Praise to God 1475, on the 29 th day of December in Naples.	
<u>Inventory of my wealth.</u>	
First, I find I have cash in coins	ducats 4,000
In the Gueruzzi bank	ducats 2,500
In the State Loan Office, 8,000 cameral ducats at 25 ducats per 100 cameral ducats, totals	ducats 2,000
Houses for rent, 10 in the San Polo district	ducats 8,000
100 loads of 'cholli' peppers, which I believe are worth 60 ducats per load, totalling	ducats 6,000
Debtor: Ser Antonio Contarini at par on the exchange	ducats 900
Creditor: Ser Francesco Zane for the rest of the cloth	ducats 100

Figure 1. De Raphaeli's *aventario*⁷

No examples of an *aventario* have survived in the account books of this period, raising doubts that this was anything more than an artificial device created by a tutor to aid instruction. However, Pacioli also used an *aventario* (which he called an *inventario*) to introduce the journal entries to make at the beginning of a business. It was prepared on a sheet of paper, or in a separate book. In his description of the same process, Tagliente (1525) states that this is a simplified list compared to one that would be prepared in practice, that it is presented in this abridged form so that the student can better learn and understand the process, and that it is prepared on a sheet of paper. The *aventario* was not, therefore, an artificial device created by the tutors, but something recommended to be used by merchants when they opened their journal for the first time after starting a business.

The aventario –v- the trial balance

Concerning the relationship between an *aventario* and a trial balance, de Raphaeli is silent. He teaches only the journal, not the ledger, which seems to have been the second stage of instruction in double entry. As a result, while he does present the journal entries from another *aventario* at the beginning of Section II, it is again for a new business, not one for an existing business that is transferring balances to a new ledger. To answer the question of how close it was to a trial balance, we must instead look to what we know of Venetian bookkeeping practice.

A trial balance is struck when a ledger is closed. We know from surviving Venetian account books of the 15th century that this process revolved around the ledger without

⁷ The two pointing fingers in Figure 1 are *manicule*, a sign dating from the 12th century that was used in books to indicate something important. In de Raphaeli's manual, it is used primarily to indicate the start of a new topic.

involving the journal. Andrea Barbarigo, for example, prepared an account inside his old ledger containing a list of the old ledger balances – a *conto saldo di debitori e creditori* (balance account of debits and credits).⁸ This was done to close his ledger and then open a new one. Barbarigo does not total the two sides of the account so, like an *aventario*, its form does not qualify it as a trial balance. It was used solely to facilitate the transfer of the balances to the new ledger. The difference between Barbarigo's account and de Raphaeli's *aventario*, and those of these other tutors, is that Barbarigo's was recorded on two sides in an account in both the old and new ledger, not on a sheet of paper, and it was not entered in the journal. Thus, de Raphaeli's *aventario* was what Tagliente described: a record solely used for opening the journal of a new business. As such, it was ideally suited to be the first exercise included in a manual of instruction on that book. It was not used for anything else.

The money of account

To be able to produce balance sheets and income statements directly from a double entry bookkeeping system, the use of a single money of account in all entries is essential. This necessity applies at all stages: at the transaction level, at the account level, and at the first stage of closing a ledger. Pacioli (1494), who described only the recording of transactions, corrections of errors and the process of closing a ledger, stated that use of a single money of account was essential when the aim is to maintain a record of the financial impact of each transaction in double entry. In the context of what he covered in his manual, he was motivated by the need for the two entries made for each transaction to be recorded in the same money of account, and also all other entries in those accounts, if a balance on an account was to be readily identified. He was also motivated in making this statement because without use of a single money of account, the device mentioned by Pacioli that could be used to check that a ledger had been closed correctly – the *summa summarum* – and the device he said could be used to check the correctness of the ledger – the *bilancio*⁹ – could not be prepared. It was this use of a single money of account that most clearly distinguished double entry from the form of tabular accounting, possibly derived from the bookkeeping methods of the Romans, that was adopted in 14th century Lombardy. It embraced a system of mixed moneys of account where a single money of account was used in each account, but different accounts used different moneys of account (e.g. Martinelli, 1974, especially p. 266).

One of the major characteristics of moneys of account is that they were rarely 'real' currency, so merchants could not be paid with or pay out 'money of account'. For very obvious reasons, merchants had to be very good at arithmetic – customers would not be likely to wait for a long time while the value of what they were offering in payment was converted into the money of account; and a merchant would not want to take long over it either: a lengthy delay could result in loss of other potential business. This was one reason why training as a bookkeeper also embraced training in arithmetic. That this

⁸ For a fuller description of Barbarigo's bookkeeping, see Lane (1944, pp. 171-183).

⁹ The *bilancio* contains a list of all the debit balances and a list of all the credit balances. Pacioli stated that if the total of each list was not equal to the other, an error had been made in the ledger.

occurred while de Raphaeli taught his pupil can be seen in how the number of arithmetical errors decreased in the second half of the manual.

The money of account used in the manual for the entries in the columns to the right of the journal entries was the gold *lira di grossi*, which comprised of *lire*, *soldi*, *denari*, and *piccoli* in the ratios 1:20:12:32. The exchange rate used with the principal transaction money, the gold ducat, was 10 ducats to 1 lira. This rate of conversion was standard practice in Venice at that time and the *lira di grossi* was used for wholesale, not retail trade (Mueller, 1997). De Rapaeli 's student is being prepared to enter a large business.

Purchases and Sales

At the beginning of Section II, de Raphaeli repeats the exercise of opening a journal for a new business, but does so without first presenting an *aventario*. It seems most probable he had told the student to whom he was dictating the text that he should follow custom and write down the *aventario* on a separate sheet of paper, rather than in his 'journal', for that is what the manual now becomes. The date is the first day of the Venetian calendar year, March 1st, and all the entries relate to a business – none are about personal property, such as household goods:

- 2,580 ducats in cash, and
- nine different products held for sale –
 - ginger (980lbs),
 - cinnamon (980lbs),
 - wax (2,480lbs),
 - cotton (3,984lbs),
 - brazilwood (8,930lbs),
 - nutmeg (843lbs),
 - quicksilver (1,368lbs),
 - cloves (740lbs), and
 - 9,360lbs of French wool.

The merchant then begins to purchase more inventory: 80 barrels (9,780lbs) of honey, 142 pieces of moleskin, 140 metres of silk, 5,000lbs of soap. Sales then follow:

- all the 980lbs of ginger, sold at 16 ducats per 100lbs compared with its value in the *aventario* of 13;
- all 980lbs of cinnamon, at a profit of 4 ducats per 100lbs;
- all 2,480lbs of wax, at less than 2 ducats above its *aventario* value; and
- all the cotton at only 24 ducats more than its *aventario* value.

This was not an abridged list of inventory, nor a list of purchases of a small-sized business, but the volume typical of a wholesale merchant (Mueller, 2017). Gone is the simplicity of calculation of the transaction value and the money of account that was evident in the first *aventario*. The amounts are realistic, not artificially low. Some of the calculations are complex, and trade is not always at a good profit. This is the case throughout most of the manual, but the volume of transactions is kept low, so limiting the examples to an appropriate number for a manual of instruction.

Brokerage fees on sales and transaction tax (the *misataria* fee) on all transactions are also introduced. All brokerage fees and the *misataria* fee on purchases were entered separately from the transaction, but the *misataria* fee was subtracted from the amount recorded for purchases and, having deducted the seller's share from the amount to be paid, the purchaser was responsible for paying his share and the seller's share to the office of the *misataria*. The seller made no entry for the *misataria* fee but deducted it from the value of the sale when recording that transaction. As shown in Figure 2, the seller debited the brokerage fee on a sale to the account of the item sold. In this case, ginger.

<i>D^r</i> Ser Ghabriel d'Alban <i>C^r</i> Ginger, 980 lbs at 16 ducats per 100 lbs equals 156 ducats, 9 grossi, 6 piccoli. Reduced by my part of the <i>Misataria</i> at 1 per cent, 1 ducat, 13 grossi, 20 piccoli. Leaving net 175 ducats, 5 (grossi), 18 (piccoli).	£ 15	s 10	d 5	p 18
<i>D^r</i> Ginger <i>C^r</i> Cash, paid to Ser Domenego Falchon for brokerage, 2 ducats, 16 grossi, 0 piccoli.	£ -	s 5	d 4	p -

Figure 2. A journal entry for a sale of ginger net of the *Misataria* fee, and a journal entry for the brokerage fee on the sale.

A merchandise expense account was used to record various expenses relating to purchases. In this series of examples, an entry for one can be seen relating to a purchase of moleskin. Venetian merchandise expense accounts were simply holding accounts that were cleared when payment was made. When a merchandise expense was incurred on a purchase, the merchandise account was debited and the merchandise expense account was credited. This can be seen in Figure 3.

<i>D^r</i> Hairy moleskin <i>C^r</i> Ser Marcho Moresini, for 142 pieces at 4 ducats per piece, total value 568 ducats, 0 grossi, 0 piccoli. Reduced by his part of the <i>Misataria</i> at 1½ per cent, 8 ducats, 12 grossi, 15 piccoli, leaving net 559 ducats, 11 (grossi), 12 (piccoli).	£ 55	s 18	d 11	p 12
<i>D^r</i> Moleskin, as above, <i>C^r</i> L'Ofizio de la <i>Misataria</i> , on an overall total of 568 ducats at 1½ per cent equals 17 ducats, (0 grossi), 30 (piccoli).	£ 1	s 14	d -	p 30
<i>D^r</i> Moleskin, as above, <i>C^r</i> Merchandise expense account for lagoon transport and porters, 1 ducat, 15 grossi, 0 piccoli.	£ -	s 3	d 3	p -

Figure 3. A journal entry for a purchase of moleskin net of the *Misataria* fee, the payment of the fee for the purchase plus the seller's share of the fee, and the merchandise expense account entry on the purchase.

When the expense was paid, in this case the lagoon transport and the porters, the debit was to the merchandise expense account and the credit to the account of the form of settlement, cash, bank, etc.

Buying and selling on someone else's behalf

Merchants at that time not only bought and sold for themselves, they acted as agents for other merchants, taking commission which they charged to the cost of the item sold. The next three figures show how this was recorded. Figure 4 shows the merchant Rafael's record of the purchase of some cloth acquired on behalf of his client, Ser

Nicolò de Zorzi.

<p>D^r Vicentine cloth purchased on behalf of Ser Nicolò de Zorzi C^r Ser Zuan de Polo de Vizenza, 40 rolls at 18 ducats per roll equals 720 ducats. Reduced by the <i>Misataria</i> fee, 1 per cent, 7 ducats, 4 grossi, 25 piccoli, leaving net to pay 712 ducats, 19 grossi, 7 piccoli.</p>	<p>£ 71 s 5 d 7 p 7</p>
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Figure 4. The recording of a purchase of cloth belonging to a client.

Figure 5 shows the sale of some wool for the same client, to Ser Antonio di Lorenzo.

<p>D^r Ser Antonio di Lorenzo C^r Wool belonging to Ser Nicolò de Zorzi, 12 sacks, weighing 4,980 lbs at 12 ducats per 100, equals 597 ducats, 14 denari, 12 piccoli. Reduced for my part of the <i>Misataria</i>, 1 per cent, 5 ducats, 23 denari, 13 piccoli. Leaving net 591 ducats, 14 denari, 31 piccoli.</p>	<p>£ 59 s 3 d 2 p 31</p>
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Figure 5. The recording of a sale of wool belonging to a client.

A few entries later, the agent's commission on the sale of the wool is charged to the wool account.

<p>D^r Wool belonging to Ser Nicolò de Zorzi C^r Commission of mine, Rafael, for sales, 597 ducats, 14 denari, 13 piccoli, at 3 per cent, equals 17 ducats, 22 (grossi), 8 (piccoli).</p>	<p>£ 1 s 15 d 10 p 8</p>
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Figure 6. The recording of the agent's commission on a sale of wool.

Voyage accounting

Voyage accounting features in many entries in the manual and is also prominent in the manuals of Tagliente (1525), Manzoni (1540), and Casanova (1558a,b). Pacioli (1494) mentions it but does not go into any details. De Raphaeli presents entries relating to two forms of activity: voyages conducted by an agent (*recommanda*) on behalf of the merchant and voyages conducted in person (*in persona*) by the merchant. He presents a simple case of each of these followed by a more advanced case, in Sections IV and VII for voyages by agents; and in Sections VI and VIII for voyages *in persona*. The first two entries for the first *recommanda* voyage is shown in Figure 7. The abbreviation 'KL' at the top represents *kalende*, indicating that these are the first entries for the month of May.

1475					
KL		On day 4 of May			
✍ D ^r	Voyage to Beirut entrusted to Ser Iacomo Ghabriel C ^r Silver, 50 <i>miara</i> , 7 ounces, 3 quarts aboard the galley of Captain Ser Nichollò Vendramin. Total, with all expenses incurred prior to boarding the galley, 337 ducats, 20 denari, 28 piccoli.	£ 33	s 15	d 8	p 28
D ^r	Voyage as above C ^r Green and black moleskin 12 pieces, 240 <i>brazza</i> , entrusted to the aforesaid Ser Iacomo aboard the galley of Captain ser Antonio Grioni. Total, with all expenses incurred in boarding the galley, 69 ducats.	£ 6	s 18	d -	p -

Figure 7. The first entries for the voyage by an agent to Beirut.

The investment in the voyage is the total of these entries: 40 lire 13 soldi 8 denari 28 piccoli. The voyage made a profit of 14 lire 6 soldi. The agent reinvested this profit and brought back ginger, cinnamon, and pepper.

For each of the other voyages, a company was formed, items for sale were purchased. Figure 8 shows the opening entries for the company formed for the second of the voyages *in persona*.

KL		Here begins the journey On the 1 st day of August			
✍ D ^r	Cash C ^r Company of myself, Marin de Rafael, of master goldsmith Zorzi, and Ser Zuan de Fiorio de Raguxa. I hereby give 500 ducats for my share in the profits and losses, by the conditions set out in the agreement of fellowship agreed between us.	£ 50	s -	d -	p -
D ^r	as above C ^r as above, 500 ducats contributed by master goldsmith Zorzi for his share in the profits and losses.	£ 50	s -	d -	p -
D ^r	as above C ^r as above, 500 ducats contributed by Ser Zuan de Fiorio for his share in the profits and losses.	£ 50	s -	d -	p -
On day 2 of the above.					
D ^r	Basic cloth, of various types purchased on behalf of the company, C ^r Cash, 300 ducats, as shown below: 2 blue pieces; at 12½ ducats per piece, in total 25 ducats, 0 denari 3 scarlet pieces; at 22 ducats per piece, in total 66 ducats, 0 denari 6 dark coloured pieces; at 10 ducats per piece, in total 60 ducats, 0 denari 10 dry pink pieces; at 14 ducats, 21 denari per piece, 149 ducats, 0 denari In total for the cloth 300 ducats.	£ 30	s -	d -	p -

Figure 8. The first entries for the voyage *in persona* to Ponente (i.e. ‘the west’): company formation and the first purchase of goods to be sold on the voyage.

The voyage begins a week later. The last entries are recorded on the 31st of the month: two barter of wheat for slaves. The wheat, itself, had been acquired 6 days earlier in a barter for cloths. As can be seen in Figure 9, these final transactions are recorded in two stages. First the sale of wheat is recorded and the buyer is made a debtor. Then, the debt is settled by crediting the buyer and debiting an account for slaves. The slaves are then taken to Zaragoza¹⁰ and bartered for sugar, which is taken back to Venice.

¹⁰ Zaragoza is inland and is certainly a mistake. The most likely location is Syracuse, which was on the trade route this voyage took.

On day 31 of the above	
D^r Abram Moro C^r Wheat belonging to the company, for 504 bushels, at 2 ducats to the bushel, makes a total of 1,008 ducats. A barter of dark skinned unbaptised slaves, at 24 ducats to the slave.	£ 100 s 16 d - p -
D^r Hodonmur Moro and Company C^r Wheat belonging to the company, 4,380 bushels, at 2 ducats to the bushel, makes a total of 8,760 ducats, in barter for unbaptised slaves, 24 ducats to the slave.	£ 876 s - d - p -
D^r Unbaptised slaves, a variety, belonging to the company, [C^r] Abramo Moro. They number 42, of which 30 male and the rest female. Each one at a flat rate of 24 ducats, making overall 1,008 ducats. It was a barter for wheat.	£ 100 s 16 d - p -
D^r Unbaptised slaves, a variety, belonging to the company, C^r Odonmur Moro and Company. They number 365, of which 245 male and the rest female, bought at a flat rate of 24 ducats each. It was a barter for wheat. Making overall 8,760 ducats.	£ 876 s - d - p -
Take note that on arrival in Zaragoza I bartered these slaves for sugar. From here I depart with it and return to Venice. And you will be able to take the sugar on the next voyage to Ponente. For that trip, you should make the voyage the debtor.	

Figure 9. The entries for two transactions involving barter of wheat for slaves.¹¹

Investments in forced loans

Section V contains eight entries relating to investments in Government credits. Four purchases are made on 16th May. Then, on 21st May, interest is received on two of the holdings. The amounts gained are credited to profits and losses and, in a second stage recorded in separate journal entries, the cash received is debited. The system arose because governments in many of the major cities of Europe did not like using direct taxes. Instead, they placed indirect taxes on various commodities and used a system of forced loans to raise money when the need arose, such as to pay for wars. In Venice, the amount required to be paid was based on the ability to pay, i.e. individual wealth. Indirect taxation paid the interest on these ‘loans’ and provided the funds for their repayment, but repayment was relatively rare in the 15th century, and they circulated as the equivalent of government bonds:

Government credits could be transferred by sale, by testamentary bequest, or by contract of gift or dowry; they could be lent, pledged as surety for nearly any kind of transaction, including bank loans, or used as money in payment of private obligations (Mueller, 1997, p. 458).

This form of investment was extremely popular in Venice until the mid-15th century but, by the 1470s, market value had fallen – the four purchases recorded in Section V are at a rate of 20% of par value – and interest payments were 20 years in arrears (ibid. p. 463). In 1454, the system was suspended and replaced a few years later with a direct tax, the *decima* (ibid. p. 466).

¹¹ Slaves were expensive. The 24 ducats value of a slave was the same amount as one year’s rent of a shop on the Rialto.

The *decima* and property

The *decima* was introduced in 1463 and was a property tax. The final part of Section XI is missing, but the last entry shown is for a payment due for the *decima* relating to property in San Polo. The merchant had houses in that district which he rented out. The tax was offset against the income from these rentals by being debited to the rent (received) account. The rest of this section concerns the rentals and upkeep of these houses. They show that rent was paid in cash and by a barter for wheat. The penultimate entry is for a bad debt relating to a tenant who fled. As with the *decima*, the amount of the bad debt is debited to the rent (received) account as an expense.

D^r Rent C^r Ser Anttonio Girardo, 32 ducats for a house he leased in San Polo number 10, who fled. There is no hope of receiving anything from him.	£ 3 8 4 2 - 5 -
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Figure 10. The entry for a bad debt.

A silk shop

In Section IX. the manual switches from what has primarily been generic activities of Venetian merchants of that period, such as can be seen in surviving Venetian account books of the 15th century. The focus now appears personal to the student, whose name is used as the name for the merchant. Section IX has 55 journal entries relating to a silk shop. The silk industry was very active in Venice, which was one of the primary European centres of that industry (Mola, 2000, p. xvi). However, very little is known of the Venetian method of bookkeeping for silk. These examples represent a unique insight into that practice. Two distinct activities were involved: manufacture and sales. The business started by renting a building. An account was kept for the 'costs of preparing the shop', i.e. the costs of converting the leased building for use in the business. However, the costs of wood for shelving and beams and their tooling and fitting were charged to an account for extraordinary expenses.

Separate accounts were kept for each batch of cloth, i.e. raw material. If raw materials were sold, the account for that raw material was credited. When a batch of cloth had finished production and was placed on sale in the silk shop, it was charged as an expense to an account for the silk shop. Weaving loss or wastage of material during manufacture was identified by comparing the weight of a piece when it was passed to the shop against the original weight of the raw materials. The entry made was a proportional upwards adjustment to the calculated cost per pound weight of the piece transferred in the narrative of the journal entry that recorded the transfer to the shop. The waste was not separately recorded.

All sales were credited to the silk shop account. When something was received in a barter sale, an account was opened for it and that account was credited when it was sold.

Two grades of workers were involved in manufacturing (spinning): the spinners (*filatori*) and the silk specialists (*maestre*). A separate account was held for each group, with entries made from a separate notebook in which all the expenses relating to them were entered, one for the *filatori* and another for the *maestre*. The entries in the accounts

were for the cumulative expenses up to a point in time, not for individual expenses incurred.

A single account was kept for rent of the building and wages of those involved in managing and operating the business as a whole: the factor (manager) and the handyman. Wages were either paid in cash or by bank transfer.

Building construction

Section X contains 18 journal entries relating to construction of a building. It is not a simple dwelling, but one containing a sculptured marble balcony, carved columns, two ornate walkways decorated with cherubs and vines, a coat of arms painted on marble, and 20 murals – yet more evidence that this teaching assignment was for a student from a wealthy family.

Bills of exchange

Section XII contains 23 journal entries that reveal the mechanism used by merchants to earn profit by issuing bills that were then refused (*protesto*). Bills circulate through the entries with some advice offered at the end of the section on how to ensure that profits are made:

Note that when you want to address a bill of exchange to someone, if that person does not want to accept it, it follows that the refusal represents an additional expense. (For this reason) you (should) set the exchange rate to sterling sufficiently high to cover the costs you may incur (if this happens).

This section begins after the missing pages, but the first entry is prefaced with a *manicula*, which, being consistent with the rest of the manual, indicates that this is the beginning of the coverage of this topic.

The bills are issued through the Cosimo de' Medici bank. Two of the first three issued are to be honoured in London, and both are refused, being returned at a poorer exchange rate than the one at which they were issued—this generates a profit for the merchant who issued the bill – and commission is also charged and credited to the agent in London who refused the bill. As a result, after the merchant gave one client 50 lire, when it was refused the client was charged 53 *lire* 19 *soldi* 7 *denari* 13 *piccoli*, because the exchange rate to English *sterlini* was lower than the rate used when the bill was first issued. A further 4 *soldi* 6 *denari* was charged for commission: a total charge of 54 *lire* 4 *soldi* 1 *denari* 13 *piccoli*. The profit for the merchant of 3 *lire* 19 *soldi* 7 *denari* 13 *piccoli*, or 8%, reveals just how profitable giving short term loans on this basis could be.

On the 29 th day of the above.	
<p>D^r Ser Zecho de Tomaxo of London C^r Cash, 500 ducats paid in cash to Zuan de Marchanuova for a bill of exchange for London, (at) 56(d) sterling per ducat, according to the custom. Handled by the Cosmo de Medeci (bank).</p>	<p>£ 50 s - d - p -</p>
...	
<p>D^r Ser Zuan de Marchanuova C^r Ser Zecho de Tomaxo, 539 ducats, 19 denari, 13 piccoli, for the refusal of a bill (of exchange) of his. It was (issued) at 56½(d) sterling per ducat and returned at 52⅓(d) for its failing to be accepted by the correspondent.</p>	<p>£ 53 s 19 d 7 p 13</p>

Figure 11. The journal entries to record the issue of a bill of exchange to be drawn in London and to record its refusal. (Note: the second entry contains an error. The bill was issued at 56 sterling not 56½.)¹²

Maritime insurance and recording the profit or loss on voyages

The final section of the manual includes nine journal entries relating to maritime insurance¹³ (plus one unrelated entry for agent's commission): premiums paid, recovery of amounts due when pirates steal cargo off two different ships, and recovery of the amount due when cargo on a third vessel is lost. This section has far more instruction than the others, including instructions on what to do when you have completed a voyage *in persona* and you have forgotten to enter some expenses against the voyage: "*enter them in the account for profits and losses, so reducing the amount you will earn*"; and what to do with the account for profits and losses when you close a ledger:

record the balance on the account for profits and losses in the capital account. Do not ever think of combining any other profits or losses with that one just mentioned. Pay attention to how much you earn [as shown in that other account] and record it in the capital account.

Thus, the profits and losses of each voyage *in persona* were kept separate from any other profits and losses. They were not viewed as part of the core activities of the business, but the profit each earned was to be given close attention.

Discussion

This article presents several examples from de Raphaeli's manual that point to the importance at that time of knowing the profit of each activity. Costs are treated as direct costs of the activity, not of the business – for example:

- a bad debt relating to the account of a tenant was charged to the rent account, not against the business as a whole.
- Commission on sales on behalf of a client are charged as an expense to the account of the item sold, not to the account of the client. Brokerage tax (i.e. purchase tax and sales tax) is deducted from the cost/revenue and only the net amount is

¹² In the manual, these entries are recorded under the same date, presumably for pedagogical reasons. In reality, 6 months would have elapsed between them.

¹³ For more information about medieval maritime insurance and how it was recorded see, for example, Edler de Roover (1945) and Kuter et al (2020).

recorded; but, when the tax is recorded by the purchaser, the sum of the tax on the seller and the tax on the buyer is added to the cost of the merchandise in the purchaser's ledger.

- Brokerage fees are charged as an expense to the item purchased.
- Incidental costs, such as city rights fees, tips, departure tax, storage charges and freight charges – lagoon transport, hire of a barge, porter fees, and tips –when specifically for an item, are charged as a direct expense to that item.
- When incidental costs are for a number of different items, they are charged as an expense to a merchandise expense account, from where they are apportioned as indirect expenses between the accounts of the items involved.
- Voyages *in persona* are treated as separate businesses with their profit or loss recorded in the merchant's capital account, not through his main account for profits and losses.

Conclusion

In 36 pages, de Raphaeli presents an insight into 15th century Venetian trade and mercantile affairs. He focuses almost exclusively on the journal with the ledger mentioned in passing on the first and last pages. The sophistication and maturity of the bookkeeping system is far beyond that presented by other authors of instructional text in the 15th and early 16th centuries: Pacioli (1494) and Tagliente (1525); and the detail of voyage accounting is far greater than that presented in Manzoni (1540). It is very similar in style to the records on this topic maintained by Andrea Barbarigo. Of the other 16th century tutors, only Casanova (1558a,b) offers more on this subject.

The coverage of a silk shop is unique among all the manuals and is the only known example of how the activities of this industry were recorded in Venice. Almost certainly, the detail is due to the personalisation of the material for the client, something that could not be replicated in a mass-published book, which is the nature of all the other instructional manuals that have survived.

From records we have of people who lived and worked during this period – bankers, ship captains, merchants, and people of standing, most of those named in the manual are likely to have been real individuals, as are many of the transactions: they are realistic, both in values and in amounts. Obviously, a real merchant would have many more transactions and things would take much longer to unfold, but it is only in the shortening of elapsed time that this manual could be said to lose an air of realism. This attachment to reality makes this an even more useful manual for the student who will have heard of many of the people it names.

There are many arithmetical errors in the manual, but perhaps no more than you would expect from a student inexperienced in the calculation of rates of exchange from transaction currencies to moneys of account. On the second page, there is a failed attempt to perform a multiplication in a blank space; and many of the errors in the manual involve weights and measures, which suggests that this student was not just a novice at bookkeeping, but also at mercantile arithmetic, and that this manual is the outcome of his simultaneous tuition in both subjects.

Whether that student, Zuan de Domenego, had a successful career in business, we are unlikely to ever know, but this manual certainly prepared him in those aspects of Venetian business far beyond the bookkeeping that is the vehicle for their coverage. It is more than a manual on bookkeeping. It is a manual on business and business practice, just as are the manuals of Manzoni (1540) and, more so, the manuals of Casanova (1558a,b). But, de Raphaeli's manual is the only one that gives us insights into a period, the 15th century, for which we have very few extant copies of Venetian accounts. Pacioli only scratches the surface. De Raphaeli shows us how it was done.

De Raphaeli's manual reveals the maturity of the Venetian double entry system for the journal in the mid-15th century, a maturity that could not have been achieved were the system not relatively widely used. It is different from the Tuscan approach and did not come from there – Tuscans, for example, had no direct equivalent to the Venetian journal. It is quite likely the manual that gave Pacioli the foundation for his manual – Pacioli is known to have seen Cotrugli's book on the art of trade¹⁴ and the two manuals have been bound together since they were completed in 1475. Whether it was or not, it is the only example we have of the approach of the 15th century bookkeeping tutors that was embraced by the writers of the printed manuals for at least the following century; and its existence allows us now to finally understand where the approach they adopted originated.

Finally, had de Raphaeli's manual been found before Pacioli's, would Pacioli's position as the 'father of accounting' have been usurped? Possibly, but Pacioli's impact came from printing his text and the structure of his syllabus that all who followed emulated. In time, Pacioli would still have been seen as the one who made the difference and led accounting on its journey towards the system we use today.

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¹⁴ van der Helm & Postma (2000) discuss the connection between Pacioli and Cotrugli. Although they express some reservations and suggest that both Pacioli and Cotrugli copied a common source for material, this requires that Cotrugli was a copyist, which seems most unlikely given the nature of his writing of his book in 1458.

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