An Alternative Method to Debits and Credits in Accounting:
Reconstructing the Accounting Equation for Meaningful Increases
and Decreases

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Conflict of Interest

We have no known conflict of interest to disclose.

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ABSTRACT

Making accounting more accessible for business professionals is a worthy mission to improve stakeholders’ grasp of financial information. Improving the understanding of building financial statements betters the shared common language across departments, employees, and management who are pursuing the joint goals of the organization. This paper suggests an alternative approach to “Debits” and “Credits” in accounting utilizing the same equations yet changing the mechanics of journal entries. The modified approach records increase- and decrease-transactions to accounts, as found in the left and right columns of trial balance. This method eliminates the directional switch of lefts and rights in the source accounts, traditionally used in the recordation process.

*Keywords:* accounting equation, expanded accounting equation, expanded normal equation, normal equation, financial accounting, single-direction t-account, debits and credits, permanent account, temporary accounts.

1. Introduction

The present approach for first courses in accounting is in a continuous state of change fueled by educators seeking to improve upon a history of pedagogy (Phillips & Heiser, 2011; Stice & Stice, 2013). Geiger and Ogilby (2000) and Bryne and Flood (2005) find that despite the proliferation of instructional resources available for accounting education, students continue to have measurable struggles within the discipline. Byrne and Flood (2005) also suggest that early negative experiences can lead to increases in attrition and negative affect towards the subject matter and field of accounting. We agree with Pierre et al. (2009) that accounting educators can
benefit from improved pedagogy, particularly when training business professionals in introductory accounting courses.

Financial users experience the most difficulties when deciding whether to debit or credit specific accounts. Depending on the type of account, debits and credits can result in increases or decreases; this *prima facie* lack of consistency in the meaning of debits and credits is confusing and perplexing for beginners. Phillips and Heiser (2011) illustrate the counterintuitive nature of credits and debits through examples; while asset and expense accounts increase with debits and decrease with credits, the other categories of liability, equity, and revenue accounts increase and decrease in the opposite fashion. Though the preparers of financial statements possess a deep understanding of these methods and their meanings, for the business professionals who need to understand financial statements and transactions the process is challenging easily confusing.

Although Pacioli, Father of Accounting, foresaw many technological developments during his life, not even he could imagine automated systems for real-time recording of revenues and expenses when authoring the *The rules of double-entry bookkeeping: Particularis de computis et scripturis* in 1494. In Pacioli and his predecessor’s system, accountants use a manual structure for accounts with fixed locations of a normal balance (increase, decrease) or (decrease, increase) depending on the type of account. The intent of fixing the locations in the T-accounts, using the normal balances of these accounts, is to aid accounting clerks in ending up with the correct locations on the trial balance.

Pacioli (1494/2012) postulate that the design of the double-entry system provides some assurance that the accounting equation maintains its balance and accounts automatically post to the correct left or right location in the trial balance. The method proposed in this article sets the

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1 Although the first mention of double-entry accounting and journal entries is in Benedetto Cotrulgi’s manuscript *Libro de l’Arte de la Mercatura*, Pacioli regularly receives credit as the father of accounting.
relationships between all accounts, allowing for all the financial elements of a business to appear in a single expanded equation.

The expanded equation transcends beyond the normal balance in the account to the normal balance of all categories, such as assets, liabilities, owners' equity, revenues, and expenses. The normal balance of these categories corresponds to their location in the trial balance with assets and expenses on the left side and liabilities, equity, and revenues on the right side. All transactions are recorded using simple increases and decreases to these categories, which have a fixed location in the trial balance.

The method proposed in this paper contributes to accounting and business education in two ways. First, the Expanded Normal Equation (ENE) provides a method to record transactions that avoids the use of traditional nomenclature (i.e., "debits" and "credits"). Second, ENE makes the ongoing effect of transactions and their effect on all elements of the ENE more intuitive and transparent to a broader audience of end-users of transactions in accounts.

2. Background and Theory

Undergraduate accounting texts often start with an explanation of financial reporting and then continue with a discussion of the accounting cycle, the introduction of the accounting equations, and then the preparation of journal entries. Most introductory chapters start by defining the different elements of the accounting equations. Ordinarily, accounting texts classify all accounts into five basic categories: assets, liabilities, owners’ equity, revenues, and expenses. Following are some brief definitions derived from Loughran (2011):

- **Assets** are tangible and intangible items that a company holds that have value (e.g., cash, computer systems, patents). Assets are the owner’s rights or claims on an entity’s assets.
Liabilities are funds that the business owes to others such as loans, mortgages, and other claims of creditors.

Owners’ Equity (Equity) is the portion of total assets that the owners of the company fully own or have paid for outright. In other terms, this result is the excess of assets over liabilities. Owners’ Equity has two major components: Common Stock and Retained Earnings.

Revenues are the gross receipts the company earns from its sales of products or services, as well as interest and dividends from marketable securities.

Expenses are the costs the company spends to produce the goods or services that it sells (e.g., office supplies, utilities, advertising).

The trial balance is a compilation of account balances displayed in the same order as the categories listed above (Loughran, 2011). The trial balance displays assets and expenses on the left-side with a balancing right-side for the liabilities, equity, and revenues. Accountants compile the trial balance after recording all the transactions using the two accounting equations. The first traditional accounting equation (Eq 1) is the starting point for introducing the topic of accounting. Accountants refer to the following accounts as permanent, since these accounts are open for more than one accounting period. This equation contains the main components of the balance sheet. The balance sheet reflects the value of assets, liabilities, and owners’ equity of an entity at a point in time; therefore, it is static. We typically present this equation in its normal form, which requires the balance of all the assets to appear on the left side while the balance of all liabilities and the owners’ equity appears on the right side.

Assets = Liabilities + Owners’ Equity

(1)
The income statement basic equation (Eq 2) reflects the company’s financial performance over one period, typically a month or a year. The accountant computes the difference between monthly income and expenses to derive a net income or loss amount. Unlike assets, liabilities, and the owners’ equity accounts, revenues and expenses are temporary accounts; following the closeout at the end of each month, the accountant transfers the resulting net income amount to the owners’ equity.

\[
\text{Revenues} - \text{Expenses} = \text{Net Income}
\]  

Presently, the only time the accountant combines these equations is during the closing process and transfer for net income/loss into retained earnings within owners’ equity. However, the underlying reality is that those income statement transactions have an automatic effect on the balance sheet and the separation of these two accounting equations is unnecessary.

The separation of revenues and expenses in a distinct equation helped business owners focus on performance in the current period. In an automated system, this can be derived using a date-range formula separating the activity for the relevant period. Therefore, the two equations above can be combined into one to reflect the dynamic relationship between all accounts. The single equation makes the relationship between all accounts more transparent to users. For example, using one equation during a single period facilitates the understanding of all the accounts affected by a transaction, such as expenses affecting assets and liabilities. Understanding the relationship between temporary and permanent accounts clarifies the monthly financial dynamics of an entity. Except for reporting and the creation of financial statements, the
use of the single equation eliminates the need to separate the equations and better illustrates the dynamically linked relationship between accounts.

The expanded equation is not new. Needles et al. (2013), Warren et al. (2015), Weygandt et al. (2018), Williams et al. (2005), Harrison and Horngren (2008), Libby, Libby, and Hodge (2017), and other textbooks begin showing the expanded equation of accounting (Eq 3) in some form:

\[
\text{Assets} = \text{Liabilities} + ((\text{Owners’ Equity} + (\text{Revenues} – \text{Expenses}) – \text{Distributions to Stockholders}))
\]  

As the entity continues its day-to-day operations, the business activities affect their assets and liabilities throughout the accounting period and not just at the end of the month. We represent these operations with equation four (Eq 4), assuming no distributions at this point, since they will be addressed later as a contra-equity category. The mathematical expression is simplified to the following, taking the parentheticals out:

\[
\text{Assets} = \text{Liabilities} + \text{Owners’ Equity} + \text{Revenues} – \text{Expenses}
\]

We use this expanded equation as the basis for the “single equation” suggested in this modified approach to record transactions. The equation is rewritten in the trial balance format with *assets and expenses on the left and rest of the categories on the right*. The trial balance is the foundation of this alternative approach.

3. Foundation for Alternative Method
The trial balance is a compilation of monthly transactions that results in posting asset and expense balances on the left side and liability, owners’ equity, and revenue on the right side. Increasing and decreasing the accounts on the left and right side of the trial balance is the foundation of this approach. The fixed locations of the categories in the trial balance are assumed for this method.

Using the scaffolding theory, accounting instructors can assist learners in connecting gaps of problem-solving that may not available otherwise (Simons & Klein, 2007; Phillips & Heiser, 2011). Wood et al. (1976) used the term to describe using a support system to construct an object, one level at a time, like an engineering process. What the scaffolding theory offers in this application is to start beginners with a ready equation based on using normal balances of all the accounts and use the trial balance as a starting point to explain the accounting equation. When using scaffolding in the classroom, typically the learners must be attempting to solve a multi-step challenging problem. The instructor and the learners understand the end goal of following the steps, which in this case is compiling transactions into the trial balance but only the instructor knows the precise sequence leading to the result. Below is the expanded equation (Eq 5) in its normal form without contra-accounts, which will be addressed below.

\[
\text{Assets} + \text{Expenses} = \text{Liabilities} + \text{Owners’ Equity} + \text{Revenues} \tag{5}
\]

After introducing this ready equation to accounting users, they can start recording transactions that result in increases and decreases to the different accounts, keeping the equation in balance. The instructor can explain the difference between temporary and permanent accounts and how the temporary accounts are represented in the permanent accounts, one period at a time.
The temporary accounts are opened for monthly tracking and closed into the permanent accounts at month-end.

This alternative trial balance approach\(^2\) uses the expanded equation previously discussed in its normal form. We use the term Expanded Normal Equation (ENE) to identify this modified equation. For example, assets are listed on the left side of the equation, and liabilities and equity are listed on the right side; thus, the traditional accounting equation for permanent accounts (Pacioli, 1494/2012). The positioning applies to revenues and expenses as well. For example, the expense category is listed on the left since the normal balance of each expense account is on the left. All transactions to the accounts would then reflect increases or decreases without having to switch the position (left or right) in the T-account. Because the equation and the location of all the categories such as assets, expenses, and liabilities are fixed, thus the position (left, right) of all the accounts is automatically satisfied.

Explaining the ENE requires pedagogical intuition, as well. The new equation contains both permanent and temporary accounts at all times. In this proposed method, all accounts need to be presented according to their normal balances. For example, the normal balance for asset and expense accounts is usually on the left side of the account, and therefore, they should be presented on the left side of the equation. Liabilities, equity, and revenues accounts have normal balances on the right side of the account, and therefore, they should be presented on the right side of the equation. Every transaction should still have balanced sides to keep the expanded equation in balance.

To reiterate, this is the same structure as the trial balance with assets and expenses on the left and liabilities, equity, and revenues on the right. It is helpful to start beginners with the trial

\(^2\) The author has filed a patent-pending application on this alternative accounting method using the expanded normal equation (ENE) and the trial balance in 2020.
balance for an initial understanding of the ENE. This technique is consistent with the scaffolding theory approach starting with a ready solution and then explaining the supporting elements. With the use of the trial balance, it is visually apparent why assets and expenses are listed on the left of the trial balance, while liabilities, equity, and revenues are listed on the right. All transactions must have corresponding increases and decreases while keeping the ENE in balance. For example, a company receiving cash must increase the account, and a company selling inventory must decrease the account. There are logical explanations using increases and decreases to every single account after posting transactions. We provide several examples of transactions and their corresponding explanations below.

Another benefit to our proposed approach is the natural explanation of the relationship between permanent and temporary accounts. For example, if we rewrite equation four (see Eq 4) – the expanded equation – to show assets and liabilities on the left and the other categories on the right it illustrates how a change in net assets (assets - liabilities) also causes changes in owners' equity (See Eq 6). For example, an increase or a decrease in net assets is associated with an increase or a decrease in owners' equity—either the permanent equity or the temporary equity reflected in the revenues and expenses. This is consistent with the original equation (See Eq 1) only to include the temporary components as well.

\[
\text{Assets - Liabilities} = \text{Owners’ Equity} + \text{Revenues} - \text{Expenses}
\]

The method proposed in this paper assumes the use of automated software systems designed to record transactions and balances in the correct location of the accounting equation. Our proposed method also allows the accountant to focus on logical increases and decreases of
the relevant accounts instead of the multiple meanings of debit and credit combined with the left or right position for each specific account.

3.1 The ENE with contra-accounts

Adding the contra-accounts to the equation allows users to address all types of accounts, along with their normal balances. Every contra-account should appear on the opposite side of the equation of the original category. The contra-account mathematically reduces the original category that it is associate with, therefore its normal balance should appear on the opposite side of it. For example, while assets normally appear on the left side of the equation, contra-assets – which are offsets to the original account – appear on the right side of the equation. Again, contra-accounts should be presented in their normal position in the equation.

Including contra-accounts in the basic expanded equation (Eq 5) facilities a more comprehensive range of transactions. In fact, once all the contra-accounts are added, all accounts should fall within an element of the equation below (Eq 7a). In this approach, distributions to stockholders, or dividends, is a contra-account to equity, which explains its usual location on the left side of the equation since the normal balance of that account is on the left. Another example is the accumulated-depreciation account, which is a contra-asset. This account should be placed on the right side of the equation since it carries an offset balance to an asset account. This expanded equation can handle any account, including accruals (liabilities), cost of goods sold (expenses), treasury stock (contra-equity), sales discounts (contra-revenues), or bond discount (contra-liability). Keeping the equation in its normal format allows for the natural use of recording transactions while keeping the equation in balance (Exhibit 2). To prove the equation even further, one can take any published trial balance and plug it into the equation.
Additionally, taking a trial balance and separating the left and right-side categories further proves the ENE.

Assets (A) + Expenses (E) + Contra-Liability (CON-L) + Contra-Equity (CON-EQ.) + Contra-Revenue (CON-R) = Liabilities (L) + Owners’ Equity (EQ.) + Revenues (R) + Contra-Asset (CON-A) + Contra-Expense (CON-E)  

(7a)

or

A + E + CON-L + CON-EQ. + CON-R = L + EQ. + R + CON-A + CON-E  

(7b)

Accounting users can record all transactions using the left and right sides of the equation with the inclusion of contra-accounts in the ENE. The first five categories of accounts (assets, liabilities, owners' equity, revenues, and expenses) have corresponding contra-accounts. Understanding the relationship between accounts and contra-accounts clarifies the monthly financial dynamics between all the accounts for an entity, further facilitating the ease of posting to the accounts.

To summarize once more, the method presented above separates the subsidiary account position (left, right) from the underlying increase or decrease caused by the transaction. The method systematically emphasizes the increase or decrease as a first step, and then records the location in the equation as a second step. The benefit of this approach stems from the accountant's ability to focus on the common sense increases and decreases without the confusion over the position of the transaction in the account. Since, in this alternative method, the location in the account is not factored in, the use of a single direction t-account is made possible, and there is no need to switch the signs in the T-accounts.
3.2 Supporting the ENE using single direction T-Accounts

The ENE supports the use of a single-direction T-account (+, -) for all subsidiary accounts. This method does not require sign reversal within the accounts to record transactions according to the normal balance in the account. Instead, the method using the ENE assumes that all transactions are increases or decreases and the balance of the transactions can be posted to the correct location either on the left or right side of the ENE. After every transaction, the posting is recorded in the subsidiary account and in the equation; both manual and electronic posting are possible with the proposed method. In the following paragraphs, we go through an example of this using the steps of the accounting cycle.

4. The Accounting Cycle Using the ENE and a Single Direction T-Account

Using the six steps of the accounting cycle, we developed an example using the ENE as follows: (1) analyze and record transactions; (2) post transactions to the ledger; (3) prepare an unadjusted trial balance; (4) prepare adjusting entries and adjusted trial balance; (5) prepare financial statements (6) closing entries and post-closing trial balance. Since step 4, prepare adjusting entries and adjusted trial balance, is similar to step 2 and 3 in presentation using the ENE, this step is not shown here.

4.1 Analyze and record journal entries using ENE

Following is a summary list of journal entries. The account increases do not have an added notation, but decreases are noted with parentheses. Also, increases and decreases influencing one side of the equation, such as "left" or "right," are noted as such. See the example of journal entry in Figure 1b, Figure 1h, and Figure 1i.

The following entries modify the use of debits and credits in a journal entry to increases and decreases. This method allows for a visual representation of how the ENE remains in
balance. It also allows for journal entries to be presented by increases and decreases rather than
debits and credits. This visual notation presented in Figure 1a – Figure 1j allows for easy
reference to why the accounting equations stay in balance after every transaction. We show how
journal entries would appear using the ENE (see Eq 5) in Figure 1a – Figure 1j.

Once the accounting user understands the logical reasons for increases and decreases
underlying the events, they can perform the transactions in the accounts. Table 1 provides an
example of journal entries using the ENE methods proposed in this paper.

**Table 1**

*Examples of Journal Entries Using ENE*

|   | ENE Left | ENE Right |
|---|----------|-----------|
| a) Cash | 10,000.00 | 10,000.00 |
| Loan Payable |  |  |
| *The business received a loan for $10,000* |  |  |
| b) Cash | (1,500.00) | 1,500.00 |
| Utilities Expense |  |  |
| *The business paid a utility bill of $1,500* |  |  |
| c) Accounts Receivable | 15,000.00 | 15,000.00 |
| Fees Earned |  |  |
| *The business accrued for invoices not billed $15,000* |  |  |
| d) Cash | 30,000.00 | 30,000.00 |
| Common Stock |  |  |
| *The business received $30,000 cash investment in exchange for common stock* |  |  |
| e) Cash | (4,500.00) | (4,500.00) |
| Accounts Payable |  |  |
| *The business paid $4,500 for office supplies on account* |  |  |
| f) Repairs Expense | 5,000.00 | 5,000.00 |
| Accounts Payable |  |  |
| *The business received a repair bill of $5,000 on account* |  |  |
| g) Accounts Receivable | 3,500.00 | 3,500.00 |
| Fees Earned |  |  |
| *The business completed a service on account for $3,500* |  |  |
| h) Cash | (4,500.00) | 4,500.00 |
| Dividends |  |  |
| *The business paid dividends to shareholders of $4,500* |  |  |
| i) Cash | (8,500.00) | 8,500.00 |
| Equipment |  |  |
| *The business bought new equipment for cash of $8,500* |  |  |
| j) Depreciation Expense | 2,000.00 | 2,000.00 |
| Accumulated Depreciation |  |  |
| *The business recorded monthly depreciation expense for equipment* |  |  |
| **Totals** | **61,000.00** | **61,000.00** |
4.2 Post transactions to the ledger using ENE

In most of the accounting texts, the authors start explaining transactions using increases and decreases then switch to using debits and credits, emphasizing the location in the account (left, right) rather than the relationship to increasing or decreasing the balance of the account. This method separates the position (dr., left, cr., right) from the increases and decreases.

Figure 1a through Figure 1j provide examples illustrating the use of single direction T-accounts in the proposed method; as a reminder, the balances of the T-accounts are recorded on the left or right according to the category and location in the ENE.

All T-accounts should have increases and decreases on the same sides showing (+, -) for assets, liabilities, equity, revenue, expenses, and all contra-accounts. After each transaction, the accountant posts the balance to the left or right of the ENE (see Eq 8) according to the normal balance of each category. So, a net positive or negative balance of an asset account would be posted on the left-side of the ENE. Moreover, a net positive or negative balance of a liability account would be posted on the right-side of the ENE. In all the transactions, the increases and decreases in the T-accounts should be recorded in a single-direction T-account, on the left and right sides of the account. The second step is to transfer the balance of the two transacting accounts into the ENE.

Figure 1a
Single-direction T-Account: Liability and Asset Transactions

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|
|             |                             |
The business obtains a loan for $10,000. In this transaction, cash increases by 10,000 (+10,000, 0), and loan payable increases by 10,000 (+10,000, 0).

| ENE LEFT ↑ | ENE RIGHT↑ |
|------------|------------|
| Cash       | Loan Payable |
| +          | +           |
| 10000      | 10000       |

ENE: Assets + Expenses = Liabilities + Owners’ Equity + Revenues
Ex. (Assets[Cash] + 10,000) + Expenses = (Liabilities[Loan Payable] + 10,000) + Owners’ Equity + Revenue

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**Figure 1b**

*Single-direction T-Account: Asset and Expense Transactions*

**Transaction** | **Single-direction T-Accounts**
---|---

The business pays a utility bill for $1,500. In this transaction, cash decreases by 1,500 (+, -1,500), and utilities expense increases by (+1500, -) for the purpose of tracking.

| ENE LEFT↑↑ |
|------------|
| Cash       |
| +          | -          |
| 1,500      |            |

| Utilities Expense |
|-------------------|
| +                 | -          |
| 1,500             |

ENE: Assets + Expenses = Liabilities + Equity + Revenues
Ex. (Assets[Cash] – 1,500) + (Expenses[Utilities Expense] + 1,500) = Liabilities + Equity + Revenues

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**Figure 1c**

*Single-direction T-Account: Asset and Revenue Transactions*

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|

---
The business accrues for services not billed $15,000. In this transaction, accounts receivable increases by $15,000 (+15,000, -), and fees earned increases by $15,000 (+15,000, -) for the purpose of tracking.

| Accounts Receivable | Fees Earned |
|---------------------|-------------|
| +15,000             | +15,000     |

ENE: Assets + Expenses = Liabilities + Equity + Revenues
Ex. (Assets[Accounts Receivable] + 15,000) + Expenses = Liabilities + Equity + (Revenues[Fees Earned] + 15,000)

**Figure 1d**
*Single-direction T-Account: Asset and Equity Transactions*

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|
| The business receives $30,000 cash investment in exchange for common stock. In this transaction, cash increases by $30,000 (+30,000, -), and common stock increases by $30,000 (30,000+, -) for the purpose of tracking. | ENE LEFT ↑ | ENE RIGHT ↑ |
| Cash        | Common Stock                |
| +30,000     | +30,000                     |

ENE: Assets + Expenses = Liabilities + Owners’ Equity + Revenues
Ex. (Assets[Cash] + 30,000) + Expenses = Liabilities + (Owners’ Equity[Common Stock] + 30,000) + Revenues

**Figure 1e**
*Single-direction T-Account: Asset and Liability Transactions*
The business pays off an office supplies bill on account for $4,500. In this transaction, the cash decreases by $4,500 (+, -4,500), and accounts payable decreases by $4,500 (+, -4,500).

| ENE LEFT ↓ | ENE RIGHT ↓ |
|------------|-------------|
| Cash       | Accounts Payable |
| +          | -            |
| 4,500      | +            |
|            | -            |
| 4,500      |              |

ENE: Assets + Expenses = Liabilities + Equity + Revenues  
Ex. (Assets[Cash] - 4,500) + Expenses = (Liabilities[Account Payable] - 4,500) + Equity + Revenue

Figure 1f  
*Single-direction T-Account: Expense and Liability Transactions*

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|
| The business receives a bill for a repair of $5,000 on account. In this transaction, repairs expense increases by $5,000 (+5,000, -) for the purpose of tracking, and accounts payable increases by $5,000 (+5,000, -). | ENE LEFT↑ | ENE RIGHT↑ |
|             | Repairs Expense | Accounts Payable |
|             | +               | +               |
|             | -               | -               |
|             | 5,000           | 5,000           |

ENE: Assets + Expenses = Liabilities + Equity + Revenues  
Ex. Assets + (Expenses[Repairs Expense] + 5,000) = (Liabilities[Accounts Payable] + 5,000) + Equity + Revenues

Figure 1g  
*Single-direction T-Account: Asset and Revenue Transactions*
The business completes a service on account for $3,500. In this transaction, accounts receivable increases by $3,500 (+3,500, -), and revenues increase by $3,500 (+3,500, -) for the purpose of tracking.

| ENE LEFT↑ | ENE RIGHT↑ |
|-----------|------------|
| Accounts Receivable | Fees Earned |
| +               | -              |
| 3,500          | +              |
|                | 3,500         |

ENE: Assets + Expenses = Liabilities + Equity + Revenues
Ex. (Assets[Accounts Receivable] + 3,500) + Expenses = Liabilities + Equity + (Revenues + 3,500)

**Figure 1h**
*Single-direction T-Account: Asset and Contra-Equity Transactions*

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|
| The business pays dividends of $4,500 to shareholders. In this transaction, cash decreases by $4,500, and dividends, which is a contra-equity account, increases by $4,500 for the purposes of tracking. | ENE LEFT ↓ |
| Cash        | -                           |
| +           | -                           |
| 4,500       |                             |

Dividends (CE)

| +           | -                           |
| 4,500       |                             |

ENE: Assets (A) + Expenses (E) + Contra-Liability (CL) + Contra-Equity (CEQ.) + Contra-Revenue (CR) = Liabilities (L) + Owners’ Equity (EQ.) + Revenues (R) + Contra-Asset (CA)+ Contra-Expense (CE)
Ex. (Assets[Cash] - 4,500) + (Contra Equity[Dividends] + 4,500) = Net Change to left side of ENE equals is zero

**Figure 1i**
*Single-direction T-Account: Multiple Asset Transactions*
### Transaction

The business buys new equipment for cash of $8,500. In this transaction, cash decreases by $8,500 (+, -8,500), and equipment increases by $8,500 (+8,500, -).

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|
|             | ENE LEFT ↓↑ \ | ENE RIGHT ↑ |
| Cash        | \[ + \] - 8,500            |                                        |
| Equipment   | \[ + \] - 8,500            |                                        |

ENE: Assets + Expenses = Liabilities + Equity + Revenues  
Ex. (Assets[Cash] - 8,500) + (Assets[Equipment] + 8,500) + Expenses = Liabilities + Owners’ Equity + Revenues

### Figure 1j

**Single-direction T-Account: Expense and Contra-Asset Transactions**

| Transaction | Single-direction T-Accounts |
|-------------|-----------------------------|
| Record depreciation expense for the month of $2,000. In this transaction, depreciation expense increases by $2,000 (+2,000, -), and accumulated-depreciation increases by $2,000. | ENE LEFT↑ \ | ENE RIGHT↑ |
| Depreciation Expense | \[ + \] - 2,000  | \[ + \] 2,000 |

ENE: Assets (A) + Expenses (E) + Contra-Liability (CON-L) + Contra-Equity (CON-EQ.) + Contra-Revenue (CON-R) = Liabilities (L) + Owners’ Equity (Eq.) + Revenues (R) + Contra-Asset (CON-A) + Contra-Expense (CON-E)

Ex. (Expenses[Depreciation Expense] + 2,000, -) = (Contra-Asset[Accumulated-Depreciation] + 2000, -)
4.2.1 List of account balances using the ENE

Following are the cumulative account balances for the previous transactions. This is illustrated in Figure 2.

**Figure 2**

*Single-Direction T-Accounts Using ENE*

| Left Side of the ENE       | Right Side of the ENE                           |
|----------------------------|-------------------------------------------------|
| **Cash**                   | **Accumulated Depreciation**                    |
| +                          |                                                 |
| 10,000                     | +                                               |
| 30,000                     | 2,000                                           |
|                             | Bal. 21,000                                     |
| -                          | -                                               |
| 1,500                      |                                                 |
| 4,500                      |                                                 |
|                             | Bal. 2,000                                      |
| 4,500                      |                                                 |
|                             | Bal. 2,000                                      |
| 8,500                      |                                                 |
|                             | Bal. 21,000                                     |
|                             |                                                 |
| **Accounts Receivable**    | **Accounts Payable**                            |
| +                          |                                                 |
| 15,000                     | +                                               |
| 3,500                      | 5,000                                           |
|                             | Bal. 18,500                                     |
| -                          | -                                               |
|                             |                                                 |
| **Equipment**              | **Loan Payable**                                |
| +                          |                                                 |
| 8,500                      | +                                               |
|                             | 10,000                                          |
|                             | Bal. 18,500                                     |
| -                          | -                                               |
|                             |                                                 |
| **Dividends**              | **Common Stock**                                |
| +                          |                                                 |
| 4,500                      | +                                               |
|                             | 30,000                                          |
|                             | Bal. 30,000                                     |
| -                          | -                                               |
|                             |                                                 |
| **Utilities Expense**      | **Fees Earned**                                 |
| +                          |                                                 |
| 1,500                      | +                                               |
|                             | 15,000                                          |
|                             | Bal. 18,500                                     |
| -                          | -                                               |
|                             |                                                 |
| **Repairs Expense**        |                                                 |
| +                          |                                                 |
| 5,000                      | +                                               |
|                             | 3,500                                           |
|                             | Bal. 18,500                                     |
| -                          | -                                               |
|                             |                                                 |
| **Depreciation Expense**   |                                                 |
| +                          |                                                 |
| 2,000                      | +                                               |
|                             | 15,000                                          |
|                             | Bal. 18,500                                     |
| -                          | -                                               |
|                             |                                                 |
4.3 Prepare an unadjusted trial balance

Following is the compiled trial balance using the transactions listed in Table 2. Notice the titles for balances in the accounts "Left" and "Right" instead of "Debit" and "Credit."

Displaying the account balances in the trial balance by corresponding to the left and right side of the equation allows for a more precise explanation of account positions. If an account falls on the left side of the equation, then it is listed on the left side of the trial balance, and the same is for the right side. Also, note that the ENE allows negative account balances to appear if some arise. For example, if there is a negative balance in the accounts receivable account, then it is stated as such in the trial balance. This presentation should not impact the balancing of the equation since summation is defined for all real numbers.

Table 2
Example of the Trial Balance Compiled Using the Proposed ENE-based Method

|                         | ENE Left | ENE Right |
|-------------------------|----------|-----------|
| Cash                    | 21,000   |           |
| Accounts Receivable     | 18,500   |           |
| Equipment               | 8,500    |           |
| Accumulated Depreciation|          | 2,000     |
| Accounts Payable        |          | 500       |
| Loan Payable            |          | 10,000    |
| Common Stock            |          | 30,000    |
| Dividends               |          | 4,500     |
| Fees Earned             |          | 18,500    |
| Utilities Expense       | 1,500    |           |
| Repairs Expense         | 5,000    |           |
| Depreciation Expense    | 2,000    |           |
|                         | 61,000   | 61,000    |
4.5 Financial statements

Given that the trial balance is the same as in the traditional method of accounting, there should be no difference in preparing financial statements. Therefore, the statements were not presented for the example above.

It is foreseeable that the statement of cash flows may be easier to generate from the ENE, given that all accounts are included in one equation. However, at the time of this writing, the generation of the cash flow statement differently was not explored.

It is noteworthy to mention that the ENE assumes that categories such as "current assets," "current liabilities," "other income," and "other expenses" are subcategories of the main revenues and expense categories. The balancing of the ENE remains the same while including the subcategories. The location of these subcategories on the financial statement is handled the same way as in the traditional method using numerical ranges (e.g., 5000-6000, 6000-7000) in the chart of accounts.

Most accounting software captures data at the account level using debits and credits (increases, decreases). This method proposes a graphical user interface (GUI) that captures accountants’ input in a single T-account approach (+, -), and then posts to the ENE.
4.6 Month-end closing using the ENE

The closing process can occur in the equation by offsetting the accounts on each side of the ENE to the owners’ equity category and, more specifically, retained earnings. Also, dividends are offset to retained earnings in owners’ equity as a contra-equity account. The expenses and contra-equity accounts need offsets to move them to the other side of the equation, but the revenues category is merely collapsed into owners’ equity or added to it. We illustrate the closing process using equation seven as our foundation in the steps outlined below.

**Step 1:** \[48,000(A) + 8,500 (E) + 4,500 (CON-EQ.) = 10,500(L) + 30,000 (EQ.) + 18,500 (R) + 2,000 (CON-A)\]

**Step 2:** \[48,000(A) + 8,500 (E) -8,500 (Closing) + 4,500 (CEQ) - 4,500 (Closing) = 10,500(L) + ((30,000 (EQ) + 18,500 (R) Closing) -8,500 (E) Closing) -4,500 (CON-EQ.) Closing)) + 2,000 (CON-A)\]

**Step 3:** \[48,000(A) = 10,500(L) + 35,500(EQ.) + 2,000 (CA)\]

Table 3 illustrates how the closing process is possible through the use of journal entries.

**Table 3**

*Month-end Closing Using Journal Entries*

| Account               | ENE Left | ENE Right |
|-----------------------|----------|-----------|
| Fees Earned           |          | -18,500   |
| Retained Earnings     |          | 18,500    |
| Close out Revenues    |          |           |
| Utilities Expense     |          | -1,500    |
| Repairs Expense       |          | -5,000    |
| Depreciation Expense  |          | -2,000    |
| Retained Earnings     |          | -8,500    |
| Close out Expenses    |          |           |
| Dividends             |          | -4,500    |
The post-closing trial balance is presented in Table 4.

### Table 4

*Post-Closing Trial Balance for Month-end Closing*

|                  | ENE Left | ENE Right |
|------------------|----------|-----------|
| Cash             | 21,000   |           |
| Accounts Receivable | 18,500   |           |
| Equipment        | 8,500    |           |
| Accumulated Depreciation |       | 2,000     |
| Accounts Payable |          | 500       |
| Loan Payable     |          | 10,000    |
| Common Stock     |          | 30,000    |
| Retained Earnings |         | 5,500     |
| **Total**        | **48,000** | **48,000** |

5. **Conclusions**

The trial balance approach is a simplified approach to the recordation of transactions. This approach does not change double-entry accounting, which is still needed in this method. It merely simplifies transactions to mere increases and decreases posted in a fixed equation, the ENE. The ENE underlies any resulting trial balance. The ENE builds on the current expanded equation taught in the first accounting course. The ENE brings all the categories of accounting to a single dynamic equation. Therefore, new accounting users are learning the same equation as before and only presenting it in its normal format. For already accountants, this is the same equation implied in the trial balance, with the assets and expenses on one side and liabilities, owners’ equity, and revenues on the other. Contra-accounts can be thought of as derivatives of the ENE, so knowing that assets are on the left of the ENE means that a contra-asset will be on the right side of the ENE, etc. The increases and decreases to the individual accounts are more intuitive to the recorder of the transactions than “debits” and “credits,” hence the reason for most
accounting texts starting with this approach. Figure 3 illustrates the derivation of the ENE and the usage of the single-direction t-account.

**Figure 3**

The Sequence of Steps from Traditional Equation to an Expanded Normal Equation in Accounting

1 Normal form allows categories to be placed in the normal form for the category. This is similar to the normal location of accounts. An account's assigned normal balance is on the side where increases go because the increases in any account are usually greater than the decreases. Accounts on the left side of equation increase on the left side. Accounts on the right side of the equation increase on the right side. Notice that this equation is organized like any trial balance with Assets and Expenses on the left and Liabilities, Owner’s Equity and Revenues on the right.

2 Contra-accounts are placed in the opposite location of the original category. For example, Contra-Asset such as the accumulated depreciation account is placed on the right side of the ENE while Assets are on the left. Contra-accounts are opposite to the original category and mathematically have to be placed as such in the ENE. The mathematical end-result of the contra-account is deducted from the original category, thus the opposite placement in the ENE.

3 Single-direction T-accounts are (+, -) for assets, liabilities, equity, revenue, expenses, and all contra-accounts. Therefore, increases are posted on the left and decreases are posted on the right. After all transaction are posted, the balance of the t-account should be posted to the left or right of the equation above, according to the normal balance of each category.

4 All t-accounts are single direction (+, -) account. At the end, the balance of the T-account is placed in the corresponding location of the ENE. All transactions, whether applying the traditional accounting equation or ENE, affect a right and left side (or more than one right and left sides), but always keep the right and left sides in balance. The ENE corresponds to the final trial balance.

The subject of debits and credits has perplexed accounting users for centuries. Accountants may have mastered this technique, yet a non-ignorable number of beginners and consumers of financial statements may benefit from this simplified approach. Finally, the more significant benefit to this approach is the users' understanding of the underlying effect of every transaction on all the temporary and permanent accounts in a business. Being able to view every transaction with its full effect on assets, liabilities, and owner's equity generates a deeper understanding of accounting events.
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