

# Anticipated and Unanticipated Consequences of the Development of Accounting Information Systems

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## ABSTRACT

*This paper aims at objectively viewing the consequences of the development of a typical accounting information system. Accounting is a tool for organization, documentation, and rationalization of economic decisions. Some of the significant consequences, such as rationalization and legitimization of economic action, were unanticipated at the early stages of evolution of financial accounting. In making the distinction between intended and unintended consequences, the goal is to understand how the primary components of the system evolved.*

## INTRODUCTION

The purpose of this paper is to demonstrate different consequences of the development of accounting information systems and to weigh the opposing arguments of whether the consequences of accounting were actually anticipated by those who developed early accounting techniques. Behavior is a complex interaction of several human processes aimed at achieving a goal. It involves conscious or unconscious selection of particular choices of actions. The selection refers to the fact that there are other courses of action that are foregone by the individual. Based on the selection, the desired consequences are elicited. Nevertheless, the mind cannot grasp the entire consequences of a chosen course of action (Simon, 1945). Implicit in this argument is that anticipated consequences might bring around, inadvertently, other unanticipated consequences. Accounting is more important now more than it ever was, and studying its history is significant to understand its roots, impact, and the early influences that shaped those techniques.

## LITERATURE REVIEW

Accounting is "the process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information" (American Accounting Association, 1966). The definition is broad because it describes accounting as a measurement and reporting instrument for any activity with financial ramifications.

### History of Accounting

Accounting, as a tool for control and accountability, existed in a primitive form thousands of years ago in early civilizations. The Chaldean-Babylonian, Assyrian and Sumerian civilizations all had highly organized systems of government and also had the oldest surviving business records, dating as far back as 3500 BC. The records kept relate to counting crops and grain (Mann, 1994). Evidence also exists that a powerful bureaucracy, supported by accounting techniques, coordinated the political and economic domains in ancient Egypt in the New Kingdom (1552-1069 BC). Kemp (1989) argues that the bureaucratic system was rooted in devising routines for measuring, inspecting, checking, and controlling other people's activities. Detailed accounting records were kept for taxation, documentation of income and barter transactions and listing of inventory and workers' wages.

Luca Pacioli is well known today for suggesting the double-entry bookkeeping system (or the "Method of Venice"), even though the system was widely used in Italy and very refined at that time. He discussed the Journal, the Ledger, barter, company or joint venture, agency and bank accounts, income and expenditure accounts, the balance sheet, and the general rules of bookkeeping. Italian merchants helped introduce the system in the 1600s to merchants in other countries that had less organized means of record keeping.

Double-entry system was a means of reducing the uncertainty faced by the merchants and the incidence of bankruptcy, which was often due to poor bookkeeping (Mann, 1994). Mills (1994) adds that two events, the commercial revolution and printing, came together in Northern Italy to create the conditions whereby the region could invent double-entry. He attributes the commercial revolution in Italy to the expansion of population and the Crusades. Both events increased the trade passing through the Italian cities of Genoa and Venice.

### Rationality and Social Action

A distinction is made between anticipated and unanticipated consequences of purposive social action. While anticipated consequences are desired objectives of the action, unanticipated consequences are unintended products of the action that were not expected in advance (Merton, 1936). Some of the institutions, tools and techniques taken for granted in the modern days are, in fact, unintended consequences of some action. In his thesis regarding the emergence of modern capitalist thinking, Weber (1958) argues that Capitalism, as an economic ideological model, has not developed to its modern form until the West applied its "rational" thinking to commercial activity in the eighteenth century.

Though debatable, Weber's theory argues that the eighteenth century merchant did not *intend* to build the modern, well-integrated web of institutions, ethics, and technologies. All he wanted was to seek the divine salvation that only came to those who perform economically well in their daily calling. Those rational institutions that exist today are unanticipated consequences to the merchant's behavior in his quest for salvation. These consequences may be more frequent the farther one moves from the action.

## THEORETICAL FRAMEWORK

Researchers have enthusiastically attributed several aspects of our modern life to the development of accounting information systems. Highly regarded academics, such as Schumpeter, Sombart and Weber, in different disciplines have provided a great deal of arguments that accounting, either directly or indirectly, is responsible for the society's economic development, the creation of several institutional arrangements, and the emergence of large businesses. While these arguments might be true, the original intent of the developers of financial accounting during the fourteenth and fifteenth century did not receive the due attention. This section aims at presenting views regarding the anticipated versus the unanticipated consequences of accounting systems development.

### Anticipated Consequences

There is not much debate that accounting in general is a useful business tool. From Italian merchants in medieval ages to multinationals in the twenty-first century, accounting has evolved in application. Since the medieval ages, basic accounting techniques provided enterprises with an organized tabulation of accounts and the relationships among them, an efficient method of tracking funds owed to and by others, and a clear representation of how a specific business operation affects a firm. Several researchers contend that the intended consequences were (depicted in figure 1): to allow the business owner to keep track of his dealings through recording details of transactions, to hold agents accountable, and to objectively determine fair share of revenue in transactions that included partners (Carruthers and Espeland, 1997).

Even though early accounts were narrational, with all kinds of information presented, they served mainly to assist the memory of the businessman. The double-entry method could save time and prevent disputes by reducing suspicion, ignorance, and memory lapses. The audience for the account was the proprietor or record keeper alone, to whom the account answered the following two questions: "What do I own? What have I done?"

Further challenges for financial accounting came about due to business activities growing complex, in terms of value and parties involved. Accounting techniques were gradually refined to provide an objective assessment for the effect of ventures on a merchant's capital and profit motive. Even though profits were a minor concern at these early times, the maintenance of capital and improvement of a country's wealth were major ones. According to Carruthers and Espeland (1997), the audience for the accounts was separate from the record keeper and the question that these accounts answered was: "Am I being cheated?"

Through the use of primitive accounting techniques, single merchants were able to unite their resources in partnerships and trade collectively overseas for better bargains in the name of the partnership. They pooled their resources without fear of losing track of their invested capital or confusing percentages of ownership. An account in each partner's name recorded the partner's investments, withdrawals and share of profits or losses, thus providing a readily available balance. When a partner wanted to terminate his association with the partnership, he would withdraw his known amount of capital, which was recorded in his account and maintained separately from partnership operations (Schumpeter, 1939). The continuity of the business was therefore not upset, lending more credibility to the merchants and their venture and gaining more confidence from banks and customers.

Accounting also provided merchants with the ability to invest in several ventures and trade with several merchants without fear of losing money due to confusion. Merchants adapted accounting techniques to include partners' personal accounts. Their question was: "What is my fair share of the Revenues?" Additionally, the proliferation of joint stock companies in the nineteenth century still created wider audiences for accounts, ones who are even less familiar with the operations of a company. Further, investors diversified into several ventures, making knowledge of these ventures less likely. They now relied on accounts to provide needed information (Yamey, 1962).

During the nineteenth century, two important changes took place that influenced both accounting theory and practice. First, the industrial revolution brought the need for permanent, large-scale, fixed capital investment, which complicated the accounting practice because consistent allocation of expenses and revenues to artificial accounting periods became necessary. Second, depreciation was incorporated into the valuation of assets leading to a more arbitrary determination of income (Chatfield, 1977).

Moreover, the proliferation of joint stock companies in the nineteenth century made it necessary to keep track of capital and distinguish it from income, in order to avoid the reduction of invested capital. Governments in the UK and the US intervened to ensure the maintenance of capital, the preparation of fair financial statements and the regular audits of the accounts by independent auditors. Accounts now were *legally* required to answer the questions: Are investors being cheated? Is capital being maintained? (Carruthers and Espeland, 1991). Later, accounting also started serving regulatory compliance purposes, including tax reports.

The above arguments suggest that accounting has developed gradually to its sophisticated form known today. Although it started as primitive documentation

Figure 1. The need for accounting techniques in modern societies

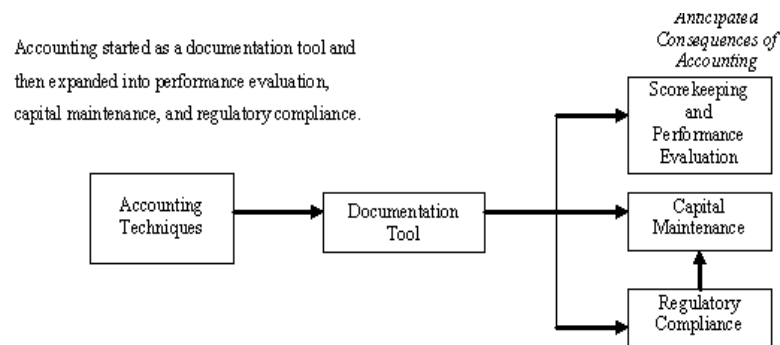
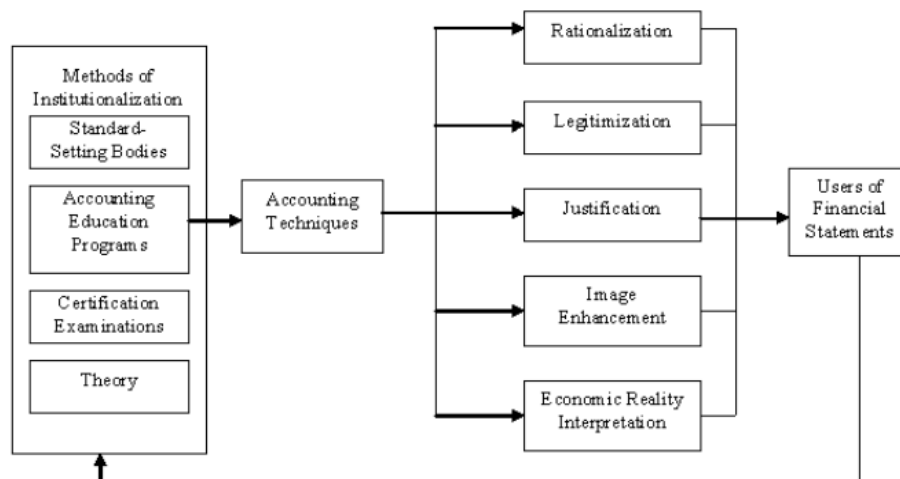


Figure 2. Accounting techniques, reinforced by institutional factors, achieve several functions that help form the reality seen by users of financial statements who attempt to shape accounting techniques through the institutions



tool, it developed incrementally as businesses started growing more complex, to serve as a tool for capital maintenance, performance evaluation, and regulatory compliance. The following propositions are made:

**Proposition 1:** Accounting systems were mainly used in the fifteenth and sixteenth century as a documentation tool.

**Proposition 2:** Accounting systems evolved during the period between the seventeenth and twentieth centuries from a documentation tool to performance evaluation, capital maintenance, and regulatory compliance tools.

### Unanticipated Consequences

Weber (1958) argues the eighteenth century merchant did not *intend* to build the modern, well-integrated web of institutions, ethics, and technologies. The theme of Weber's (1958) thesis can be equally applied to the development of accounting as an information system. Accounting has been in existence for some time and was claimed to have set in motion the wheels of development for several institutions. Two of the unintended consequences of accounting systems development are as follows. First, accounting helped enhance rationality, maximize investment outcomes, and extend the development of capitalist production methods. Second, the institutionalization of accounting took place through the development of a whole infrastructure of educational and professional bodies (see figure 2 below).

#### 1. Accounting as a Key to Enhance Rationality and Maximize Wealth

##### a. The Technical Role

Prominent social theorists claim that accounting played a key *technical* role in enhancing rationality and furthering the development of capitalist methods of production. "The most general presupposition for the existence of this present-day capitalism is that of rational capital accounting as the norm for all large industrial undertakings which are concerned with provision for everyday wants" (Weber, 1927). Accounting allows capitalists to evaluate rationally the consequences of their past decisions and to calculate current and future resources. Weber argues that rational capital accounting, along with calculable law, rational technology (mechanization), free labor, and the commercialization of economic life is an element in a general process of rationalization that is both the antecedent to and the consequence of modern capitalism.

Weber's argument is consistent with his thesis in "*The Protestant Ethic and the Spirit of Capitalism*" (1958), which concedes that rational economic behavior was essential for Protestants who sought salvation. This rational behavior could be attained only if the individual accumulates wealth through careful, rational investment. Accounting steps in by providing a means of measuring alternative investment opportunities and efficiently managing daily business activities.

Schumpeter (1950) argues that economic activity in general brings about a rational attitude, stating that "The capitalist practice turns the unit of money into a tool of rational cost-profit calculations, of which the towering monument is double-entry bookkeeping". Also, Sombart (1953) argues that capital, that amount of wealth which is used in making profits and which enters into the accounts, did not exist before double-entry bookkeeping. Through double-entry bookkeeping possibilities were created and the ideas of acquisition and economic rationalism were developed.

Weber believes that for-profit enterprises would not survive if they were not sufficiently profitable (Weber, 1978). Those enterprises that adopted the double-entry method were at a technical advantage over those that did not and, in the long run, the latter would be driven out of the market. In addition, accounts provide the necessary information to measure and compare the alternatives of a certain choice, allowing individuals to estimate the probabilities of success and the possible payoffs associated with various alternatives (Carruthers and Espeland, 1991).

Several other researchers have advocated the role of accounting in investment evaluation. Accounts provide technical information on the outcome of previous business actions (Littleton and Zimmerman, 1962), and hence an accurate assessment of the relative success of particular investments. Accounts provide a businessman with a record of current assets, which indicates the economic means at his disposal and they help make decision making more rational and so contribute to the maximization of profits (Chambers, 1966). One can safely assume that the original developers of financial accounting did not have investment decision-support as one of their main goals for accounting development.

##### b. The Rhetorical Role

Accounting was also used as a tool for projecting signals about an individual or an organization. The efficacy of pious invocations in establishing legitimacy and enhancing credibility was recognized. The account books of Italian merchants invoked the name of God for centuries. At times where papal prohibition on usury was a concern for merchants, double-entry bookkeeping was used to explicitly document the balanced nature of firm transactions (Carruthers and Espeland, 1991). Thus proving the legitimacy and justness of the business and the moral legitimacy of profits.

In addition, double-entry bookkeeping was recognized as a vehicle for self-transformation, because it required curiosity and intelligence. Failure to adhere to this method, in fact, aroused suspicion regarding one's character and resulted in degeneration. Businessmen who had to rely on others to help them manage their affairs required them to know the principles of the double-entry system and employ it in a systematic, standardized, and tabulated manner. Self-transformation was conducive to capitalist activity. Weber (1956) argues that caution, informed decision-making and the avoidance of speculation, values promoted by double-entry bookkeeping, became celebrated values and a crucial feature of advanced capitalist societies.

Accounts have been manipulated to convey a desired impression, legitimate someone's performance, or strengthen a particular position. The dependence of businessmen on credit means they are especially vulnerable to expectations and standards of other businessmen because one's credit depends on one's reputation. The extent of careful record keeping was a decisive factor in building one's good personal reputation. At early times, double-entry accounts documented a man's frugality and diligence (Earle, 1989). So individuals held accurate records to obtain credit at favorable rates. Managers always try to negotiate numbers that will make them look good. Accounts are also used to justify decisions and to excuse mistakes (Watts and Zimmerman, 1979). Income numbers are sometimes artificially smoothed to enhance retrospective appearance of predictability and certainty or to signal expectations (Barnea, Ronen, and Sadan, 1976).

Thompson's (1967) argues that organizations act to reduce the uncertainties surrounding them in the complex real world through such actions as sealing off their technical core and reducing dependencies on others. Organizations use their technical knowledge of accounting for "window-dressing". Accounting was also used to predict future environmental factors that impact an organization (e.g. future sales, expenses and demand).

Double-entry bookkeeping reduces the complexity of the economic reality and presents decision makers with a simple "bottom-line" that does not reflect all possible interpretations and judgments. As March and Simon (1958) put it, accounting is a cognitive device that influences the "premises of decision making", by determining the kind of information that was available to various audiences.

##### c. Accounting and Impact on Rationality

Skeptics of the importance of accounting argue that little theoretical change took place in the 300 years after Pacioli and that the techniques of double-entry took a long time to diffuse throughout Europe and become rigorously adhered to by most practicing businesses (Winjum, 1972). Ideally, double-entry facilitates the "economic rationality" described by Weber, Schumpeter, Sombart and modern accountants. In practice, however, the full potential of double entry was rarely exploited (Connell-Smith, 1951). Accounts were infrequently balanced (Coleman, 1963).

Yamey (1956, 1962, 1964) cautions against reading modern economic conceptions of profit and capital into pre-nineteenth century uses of double entry. Not only were such modern concepts of the organizational economy still emergent, but also the institutions of the marketplace themselves provided information adequate for the needs of the time. Virtually all economic activity in that earlier era was controlled either by market transactions or by administrative fiat, which meant that prices and rules provided the information needed for rational decision making. Account books were not an important source of information for economic decision making. They were kept primarily to provoke the memory, support claims in court, and sometimes as a way to handle negative numbers in the arithmetically unsophisticated era (Winjum, 1972). Yamey believes that the arguments of Sombart and Weber, giving strong credit to accounting for stimulating the "rationalistic pursuit of unlimited profits as an essential element in the capitalistic spirit", are overestimated.

These criticisms are consistent with Chandler (1977) who believes that until late in the nineteenth century, the invisible hand of market processes did most of the coordination and product pricing. Accounting was not seriously called for until modern firms, resulting from vertical and horizontal integration, appeared and the visible hand of managerial administration took over the coordination. Only then, accounting emerged as a powerful tool for resource allocation and control. The following propositions are needed to test the above arguments:

**Proposition 3:** In its technical sense, accounting was used as a tool for economic rationalization, investment outcome maximization, and production method development.

**Proposition 4:** In its rhetorical sense, accounting was used as a tool for self-transformation, legitimization, justification, image improvement, and selective information presentation tool.

## 2. The Institutionalization of Accounting

On the other hand, accounting is now an established discipline. The organizations, certification and qualification processes, education programs, and theory that underlie the practice of accounting today are consequences that were not envisioned by the early developers. The early institutionalization of accounting was produced by two things: education and mercantile networks (Carruthers and Espeland, 1991). The specialized education of merchants, either in schools or in apprenticeships, familiarized them with the double-entry method. Commercialization helped diffuse the double-entry method from Italy over the rest of Western Europe. The network of businessmen helped foster the formal adherence to this method, because reputation and creditworthiness within the business community were necessary for solvency and were maintained with the help of one's accounts. In the twentieth century, the dependence on accounting became very strong. Organizations can neither manage their daily operations nor design strategic plans unless a reliable accounting system provides accurate and useful information.

Standard-setting organizations, certification, and education programs were not intended as institutionalization mechanisms by the early developers of accounting. These institutions did not emerge until late nineteenth century, and since then they are in constant evolution. Early developers of financial accounting were more interested in keeping primitive records (e.g. the Journal) where transactions were recorded in a narrational form. They were not interested in preparing financial statements in their current format and thus did not conceive of standards that would govern the format and content of these statements. The following proposition is suggested:

**Proposition 5:** Early practitioners of accounting were not concerned with creating universal standards as much they were concerned with crude recording of daily events in journals.

## CONCLUSION

This paper aims at objectively viewing the consequences of the development of accounting as a system. Testing the propositions empirically may substantiate the different arguments regarding intended versus unintended consequences of the development of accounting. Based on the findings, researchers might be interested in (1) identifying a pattern of accounting development and relating it to a particular practice or institution, such as stock markets, multinationals, among others. This might prove very important to a field such as international accounting, where researchers are struggling to attribute differences in accounting practices around the world to certain events or environmental factors. It may also be important to study (2) why the unintended consequences were described as closely associated with accounting, explaining more the position of accounting in a macroeconomic setting.

Further, the degree of development of accounting at different times can be an important factor in analyzing the decisions of investors or organizations. Accounting, in its rhetoric role, may have had a stronger impact than its technical role, although the latter was studied much more extensively. Also, the resolution of the conflict of opinions between Yamey and Weber and Sombart will provide a

more clear indication of the relative strength of accounting as one of the building blocks of capitalism.

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