



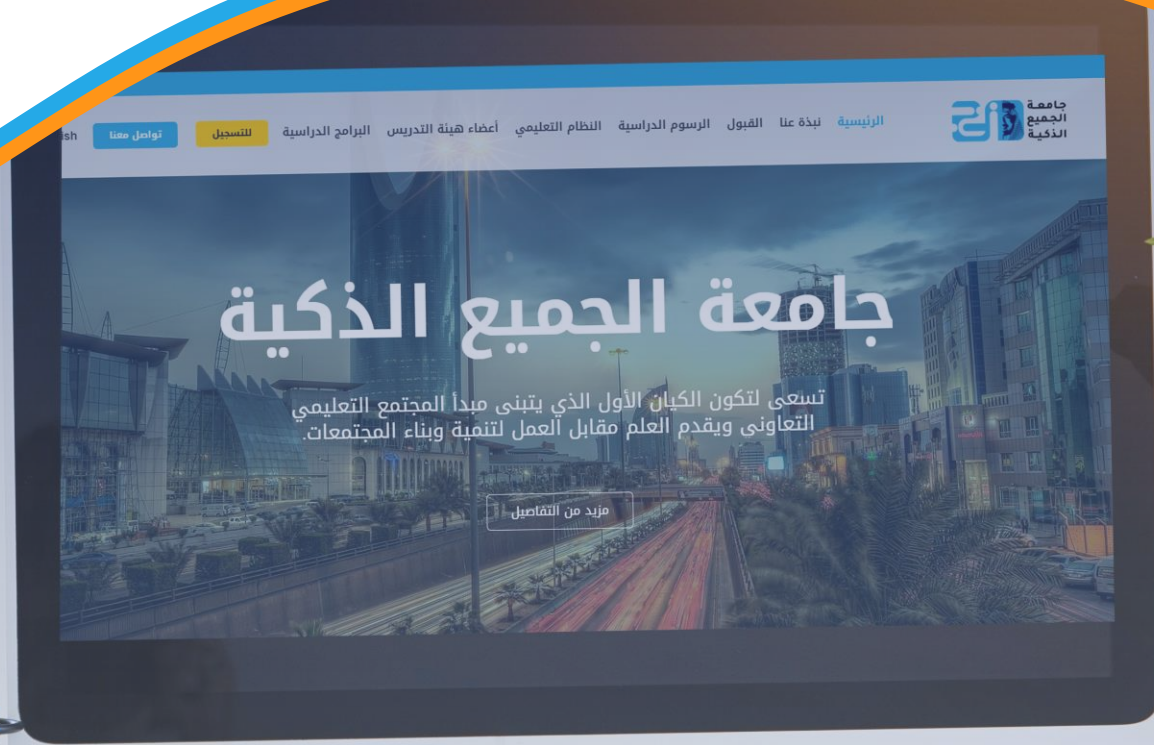
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Project Cost Management



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مزيد من التفاصيل



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safwa@esu.ac.ae

Dr.Safwa Abdalbagi

Accounting methods

The last chapter introduced the reader to the book, the built environment (BE), our case study, general accounting basics, as well as the jobsite in lieu of a home office accounting and financial management approach. This chapter provides an additional introduction to accounting basics, including why construction differs from other industries and warrants its own unique approach to accounting. The construction industry is one of the largest industries in the United States, contributing approximately one trillion dollars (\$1,000,000,000,000) annually to the gross domestic product (GDP). That is a lot of zeros! This chapter examines construction firm ownership structures and how those structures affect the four different accounting methods. Accounting is performed for both external and internal stakeholders and one use of accounting is to make sure the contractor's assets are protected and properly managed.



Uniqueness of the construction industry as it relates to accounting

There are many differences between the construction industry and other mass-production industries such as automobile manufacturing or retail sales or food service. Because of these differences, contractors must take a different approach to accounting and other forms of financial management. Some of those differences are listed here:

- * Construction is job-based or project-oriented. Each construction project is given a separate job number from the accounting department immediately after the contractor is notified of award from the client. Each project is managed independently by project teams, including the project manager (PM) and the superintendent, and is considered a separate profit source.
- * Other industries are product-based, not project-based, and provide repeat products, such as a pizza restaurant producing ten different varieties of pizzas and on any given Friday night



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- * Other industries are product-based, not project-based, and provide repeat products, such as a pizza restaurant producing ten different varieties of pizzas and on any given Friday night they might prepare 50 pizzas of each of those different types. It is very unlikely they know how much each of those pizzas cost.



- *In construction each project is unique. Most construction companies provide variable products. Even speculative home builders, or tract developers, have variable products. They may build 200 homes in a tract development with five different floor plans, but they provide several different facades and colors and interior finishes such that buyers feel their home is unique. In the next tract they may build 150 homes with seven different plans, all of them unique from the first tract choices. And all of these are on separate building lots.
- *Each construction project utilizes thousands of variable parts and materials.
- *Contractors retain very little inventory or unused materials. Speculative home builders may have a few homes finished ahead of their sales, but they try not to become over-extended.
- *Construction projects are decentralized. Each project is built on a different site in a different location – they are not all near the contractor's home office.
- * Each project utilizes different construction equipment and is built with a different workforce.



*The construction industry experiences irregular cash flow situations. Cash flow is defined as revenue coming in to the company in the form of monthly client payments, and expenditures are cash leaving the company in the form of labor and material and subcontractor payments.

* Most construction projects are subject to retention in that the client retains 5 or 10% of each month's pay request to make sure the contractor finishes the project. This would be akin to you holding \$2,000 back from a car dealer for a couple of months to make sure your car operates as they purported. Would they allow that?

* When you buy a hamburger, the business transaction is complete when you walk away from the cash register. This is a short-term contract. Construction projects have long-term contracts, which typically last six months to a year or two, and project/product warranties that last a year, or more, longer than that.

* In construction, builders execute a contract and have settled on the sale or total price of the project, but they haven't spent any money yet and will not know what the project will cost until construction is actually complete.



- * When you buy a shirt at the clothing store they expect you to pay them 100% at the time of purchase. Speculative home construction is similar. But most facets of construction rely on partial monthly bills to the client and monthly payments spread out over the duration of the contract.
- *General contractors (GCs) rely on specialty contractors or subcontractors to perform 80–90% of the work. Construction management companies may subcontract out close to 100% of the work. Imagine buying French fries and each of the 30 fries in the basket came from a different restaurant that employed a different cook who utilized a different deep fryer. Then the burger joint you were purchasing the fries from grouped them all together and sold them to you in one order.
- *Each construction project will have a different mix of subcontractors and craftsmen. Very small residential remodeling contractors might use the same subcontractors and the same craftsmen on each project – but again, each of those projects would be for a different scope on a unique site and for different clients.



- The bottom line is Construction is Unique. There will never be two identical construction projects with the same client, architect, GC, subcontractors, material suppliers, craftsmen, equipment rental, building sites, weather conditions, built on the same dates of the same year, and on and on. Even the following example was unique.



- Example One:
- This experienced owner's representative managed six elementary schools built for the same school district with the same architect and the same basic design (there were small differences) and built by the same general contractor. This was as close to repeat construction product that he had ever witnessed in construction. But each of these schools were built in different years, on different construction sites, utilizing a similar but different mix of subcontractors and craftsmen, and each school had a different school principal who had his or her own unique priorities.



- **Construction accounting**
- Accounting can be performed for construction companies in a variety of fashions as well. Some of the types of accounting services contractors utilize include:
- Some contractors employ outside accounting firms which employ certified public accountants (CPAs) to do all bookkeeping with little to no accounting support performed internally by the contractor. This would only be the case with very small or start-up contractors.
- Many contractors have an internal home office accounting department which is staffed with bookkeepers, accounts payable clerk, accounts receivable clerk, payroll clerk, controller or comptroller, and maybe someone responsible for accounting of the construction equipment and maintenance of the equipment ledger. These departments are usually headed up by a chief financial officer (CFO), although smaller firms may have all of these duties performed by one accountant who reports to the chief executive officer (CEO) who then relies on the service of an outside CPA for tax and other external reports.



- Jobsite accounting is usually only performed on very large construction projects or those cost-reimbursable open-book projects which will only pay for accounting support when it is located at the jobsite. In addition to accounting, the jobsite team has several other financial management responsibilities such as cost control, pay requests, and financial close-out, and others that are discussed throughout this book. The jobsite financial management team includes the project manager (PM), superintendent, project engineer (PE), and potentially a jobsite cost accountant or cost engineer. Look ahead to the sole-source organization chart depicted in Figure 3.8. This is the scenario that has been adopted to use for the case study and examples throughout this book. The focus will be on project-specific site-performed accounting and financial management functions, but all the while relate them to home office oversight.



- Construction is a risky business for a variety of reasons as stated here and later. It is up to each jobsite PM and superintendent to manage those risks on behalf of the company they are representing. The jobsite team and the home office utilize a variety of financial resources. Some of these are originated in the home office, often with input from the jobsite team, and other reports are generated at the jobsite. One goal of this book is for the reader to develop a general understanding of these financial reports and processes and their importance, not necessarily that you will be able to create them yourself. Managing jobsite costs and returning a fair profit for the firm is a major goal of the jobsite team. Management of cash flow is an important construction management tool; just as a hammer is an important tool for a carpenter. Managing cash is first done at the jobsite level and then at the corporate level. The lack of positive cash flow is a big source of contractor failures. Cash flow is an important topic explored throughout this discussion. A lot of built environment participants use different terms for different purposes. Many college textbooks, including construction management and accounting textbooks, also vary to some degree, especially as they relate to job titles.



Some of the different terms and positions as they relate to construction cost accounting and financial management include:

- The boss or owner of a construction company may be the CEO or President, but there are a variety of other officers that the jobsite team may report to including officer-in-charge (OIC), chief operations officer (COO), senior project manager, and others which are also described in the next chapter, 'Introduction to construction management.'
- Home office financial manager and/or general manager include the CFO and CEO.
- Home office staff support members include the accounting team listed earlier as well as staff estimators, staff schedulers, specialty superintendents, quality control officers, safety control officers, human resource managers, marketing directors, and others.
- The jobsite team or management team includes the superintendent, PM, PE, and jobsite accountant or cost engineer



Construction firm ownership structures General contractors, subcontractors, suppliers, consultants, and other members of the built environment industry, including project owners and architects, can be either individuals or companies. The most common forms of business organizations are sole proprietorships, partnerships, corporations, limited liability companies, and joint ventures. Every company involved in construction including the client, GC, subcontractors, and design firms have an 'owner' or group of owners or equity partners. The form of a business organization has an effect on how the contractor operates its business in the form of decision-making, responsibilities, profit taking, risks and liabilities, and tax obligations. Because of these variations, the contractor's



legal organizational structure impacts its approach to cost accounting and the financial management of the construction firm. This book will endeavor to distinguish the project owner from the construction firm ownership in our examples. The balance of this section is referring to the ownership of construction companies, not necessarily the client's ownership structure. Sole proprietorships are the most common business form operating in the built environment. Proprietorships are popular because they are easy to start and maintain a business that is owned and managed by one individual, the proprietor. Therefore, there is not a distinction between the business and its owner who is entitled to all of the profits but is also fully responsible for the business's actions. Requirements for forming a proprietorship change depending on the state having jurisdiction. All permits and business licenses required to operate a construction company need to be obtained by the proprietor.



For instance, a single carpenter can operate as a small deck-building business, but he or she would still need to obtain insurance, bonding, and a business license, as dictated by the jurisdiction where he or she operates. It is easy, but not necessarily advisable, for the proprietor to mix business income and expenses with that from other personal sources. Mixing of business and pleasure may have unfortunate tax implications. An additional advantage of operating as a sole proprietorship includes flexibility. The proprietor makes all decisions regarding where he or she wants the business to go, growth and expansion opportunities, and speed of decisions and responses. All of the sole-proprietor's decision-making is made by a single person. Conversely the business owner can decide at any time to restrict or slow business, terminate the business, or sell it. The disadvantages of operating a proprietorship include its unlimited personal liability, its limitations in raising money to grow and/or operate the business,



and its heavy decision-making burden, which falls solely on the proprietor. Partnerships are businesses where two or more individuals share ownership in the company. The partners' initial contributions to the company could be in the form of cash or assets, such as construction equipment, and additional contributions of time and/or assets potentially throughout business operations. Similar to a proprietorship, a partnership is closely associated to its investors. Profits are passed 100% through to the partners, similar to a sole proprietorship, and are taxed with other personal gains. However, a partnership is a distinct entity that can independently own property, hire employees, and undertake (or be the subject of) legal action. The partners do not have to hold equal 50-50 shares. One partner may have contributed 75% of the original company equity whereas another contributed 25%. The two would then distribute profits along these same ratios.



Partners can be of two types: general and limited partners. General partners share responsibilities, and profits and losses of the business. If not specified otherwise, general partners will distribute those profits, liabilities, and management duties equally. Limited partners only contribute assets and do not participate in daily management or operation of the business. In return for their limited involvement, limited partners do not participate in corporate liability beyond their initial contribution. Adding limited partners is a way for a partnership to raise capital while assuring personal immunity to the investor and complete control for the general partner. Every partnership must list at least one individual as a general partner. Difficulties associated with partnerships arise during the transfer of one partner's share if he or she dies, has a disagreement with the other partners and desires to dissolve the business relationship, or if a partner divorces and their spouse wants to retain a one half share in the construction company.



Two types of corporations exist, type C and type S. Type C corporations, or simply corporations, are legal entities owned by shareholders. Smaller contractors that originated as a proprietorship or a partnership may become a corporation by 'incorporating.' Forming a business as a corporation is a way to legally separate the equity ownership of the construction company from the management and operations of the company, which limits the liability to the shareholders to only their initial contribution. Shareholders appoint a board of directors, which selects and oversees business operations led by officers, including a CEO, COO, and a CFO. Equity owners in a corporation are often officers and active participants in the operation of the construction company and in return also receive a salary

- One additional reason a contractor may decide to incorporate is that the corporation will generally pay a lower tax rate than would a proprietorship or partnership, especially at very high income levels. Different from proprietorships and partnerships, corporations file taxes distinct from their shareholders. Profits of a corporation are taxed at a corporate tax rate,



which is often lower than a personal income tax rate. If the management decides to distribute part of the profits among the shareholders, these profit distributions are known as dividends and are subject to a second Federal income tax at the individual level. Evergreen Construction Company (ECC) is the general contractor utilized in the Olympic Hotel and Resort case study in this book and they are organized as a type C corporation. Type S corporations are smaller closely held corporations with limited shareholders. These are often new or start-up construction companies which will later transform into C corporations. One advantage of the S corporation is it avoids double taxation on dividends and the company is taxed at individual tax rates, which are lower at reduced income levels. Limited liability companies or corporations (LLCs) combine features of corporations and partnerships. Owners of a LLC are sometimes referred to as members. Similar to a corporation, a LLC would limit personal liability from ownership. Similar to a partnership,



a LLC would avoid double taxation by passing through all of its profits and losses to its members. Many real estate development projects are organized as separate individual LLCs protecting the development company and equity partners from failure on any one individual project. Real estate development companies and their financial pro forma is the subject of the final chapter of this book. Joint ventures (JVs) are business entities that resemble general partnerships. The main characteristic of a JV is its temporary scope as they are created for only a limited period of time or for a single construction project. The main reasons for using a JV on a construction project are to pool financial resources and/or physical and human resources, and for spreading risk. For example, many large infrastructure projects are built by JVs of construction companies that pool their personnel, equipment, and bonding capacities while spreading the risk of failure. Chapter 18 discusses some of the tax differences between all of these different types of construction company ownership structures.



- Construction accounting methods

As a member of the jobsite management team you are not necessarily going to be involved with the accounting processes and methods utilized by the home office accounting department and the CFO, but you should know some of the major issues. There are basically four different types of accounting processes available to construction contractors which include cash, accrual, percentage of completion, and completed contract. Each of these four methods will be described in this section in turn. They are differentiated in the processing and timing of revenue and expenditure recognition, or when they 'account' for money. The cash and accrual accounting methods are more applicable for short-term construction projects, those lasting less than one year, and percent complete and completed accounting methods are best suited for construction companies with projects lasting longer than one or two years. Accounts receivable includes the steps necessary to invoice a client for work performed and receipt of revenue in the form of payment. Accounts payable involves commitments made to process expenditures for labor, materials, and subcontracts for construction work performed.



- Cash

The cash accounting method is usually reserved for smaller contractors, such as those with less than \$5 million in annual company volume. Approximately 80% of construction companies employ ten or fewer employees and use the cash method. Contractors don't actually work with hard currency in construction, but the term 'cash' generally means a physical exchange of checks or electronic debit transfers from a bank account. The cash method is very simple. Contractors typically use a fiscal year that runs from January 1 to December 31. If a check is received from a client and deposited into the bank, it is reported as revenue. If a check is written to a subcontractor, it is reported as expenditure. The checks themselves do not have to clear the bank for either to be reported. This system does not consider work performed and not yet invoiced, nor a pay request invoiced to a client but not yet received, nor invoices received from subcontractors but not yet paid. The cash accounting method reflects very uneven cash flows. This uneven cash flow may cause problems for auditors, CPAs, the Internal Revenue Service (IRS), and equity partners who all look for consistency in financial reporting



- At the end of the year the contractor has some tax-planning flexibility in either depositing a client's check in December or holding it until January to postpone tax liabilities. The contractor may also process invoices from subcontractors early in December, although they may not be due until January, therefore moving costs or expenditures forward so that they may be deducted from this year's taxes. The cash method is also popular with designers and consultants such as architects, engineers, inspectors, and agency construction managers. Chapter 3 will describe the roles of many of these contributors to the built environment.



- Accrual

The accrual accounting method reports revenues when they are billed or earned, and become accounts receivable, but not necessarily received. Retention held by the client is not reflected as income until it is received after project close-out. Expenses are recorded when costs are incurred and subcontractor invoices are invoiced and become accounts payable. The accrual method provides a more consistent financial reporting trail than the cash method. The accrual method is generally limited to smaller contractors, similar to the cash method, which have annual volumes of \$5 million or less.



Percentage of completion

- The percentage completion method is recommended for commercial contractors which have a volume greater than \$10 million and/or have long-term contracts which may last longer than two years and overlap from one fiscal year into another. It is considered a more accurate and consistent indicator for recognizing income. This accounting method simply reports the percentage a construction company is complete at the end of the fiscal year with all of their construction projects. This is accomplished by reporting the percent of estimated costs incurred, and the proportional share of profit earned. In the case of a construction company with more than one project this is the summary of all of its project percentages completed. This is similar to invoicing against a pre-established schedule of values as will be discussed later



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Completed contract

- The completed contract accounting method is even more irregular than the cash basis. In this case, contractors do not recognize any revenue or expenditures until the project has been completed and they are paid. This method may be used for small general contractors, such as those which do remodeling projects and speculative home builders, which are paid in full upon completion. Residential tract builders are contractors which build and sell homes on a speculative basis (also known as spec home builders). They are essentially real estate developers. In the completed contracting accounting method, jobsite administration expenses and home office overhead are proportioned to projects and expenses are reported when revenues are received, at project completion, with respect to tax implications. Because a home builder may sell ten houses in one year and only two in another, based on timing of construction starts or changes in the economy, revenues may change dramatically from one year to the next with the completed contract accounting method.



Internal accounting controls

- There are many purposes of construction cost accounting as was briefly introduced in Chapter 1. One major external reason of accounting for revenues and expenditures includes reporting net income and paying taxes. There are also a variety of internal reasons for accounting which assists with management of the financial affairs of the company. Those include measurement of profits and their net effect on investor's equity; known as return on equity (ROE). As discussed, construction products are not repetitive, rather they are variable. Internal financial reports allow the contractor to perform self-diagnosis on industry specialization. Are we operating in the proper segment or focus area of the industry? Is one geographical area better for the company and our employees than another? Is our focus on the proper type and size of work? Internal accounting, or audits, also allows contractors to measure the performance of their most important asset, their people. Construction is project based, and each project is staffed with a project manager and superintendent who need to return a fair profit to the company.



- One additional reason that contractors perform internal accounting management is to ensure that jobsite and home office teams are properly managing the corporation's money. The superintendent has several financial management responsibilities on the jobsite, many of which will be discussed throughout this book. Protection of construction materials from weather and external theft, and jobsite safety and security, are under the superintendent's control. Although not always considered as financial concerns, if not addressed properly these aspects will have a negative effect on project costs. Internal financial theft is unusual, but it can happen. There are several ways a contractor can ensure that there are not any internal financial thefts. Some of these include:
 - Separate duties assigned to separate individuals such that no one person has complete financial control.
 - Keep a good paper trail, even though most of the paper trail today is produced on the computer. Only appropriate persons should be issuing subcontracts and purchase orders and signing approval on invoices.
 - Although contractors typically do not have significant inventory or assets, what assets they have, such as construction equipment, must be tracked and accounted for.



- Routine accounting operations include an internal financial system of checks and balances. Internal audits are also discussed in Chapter 18. UÊ The contractor should limit access to its financial reports to upper-management personnel only. UÊ Multiple approval signatures shall be required on as many documents as possible, especially material and subcontractor invoices. UÊ Even large contractors with substantial accounting departments will employ outside accounting assistance from CPAs to audit their own books for internal reporting as well as prepare tax reports.

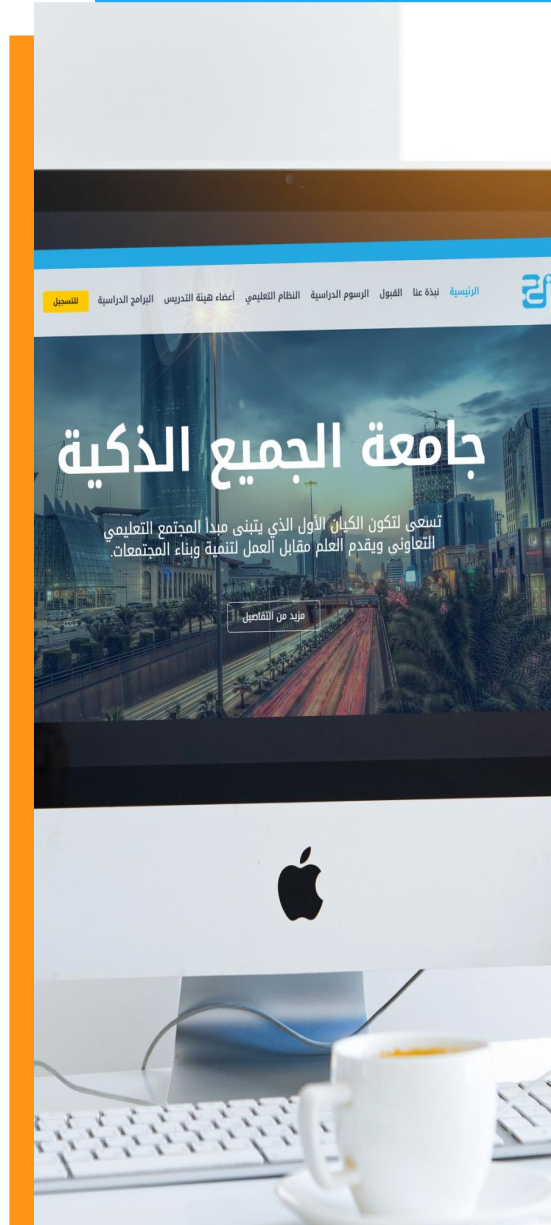


Summary

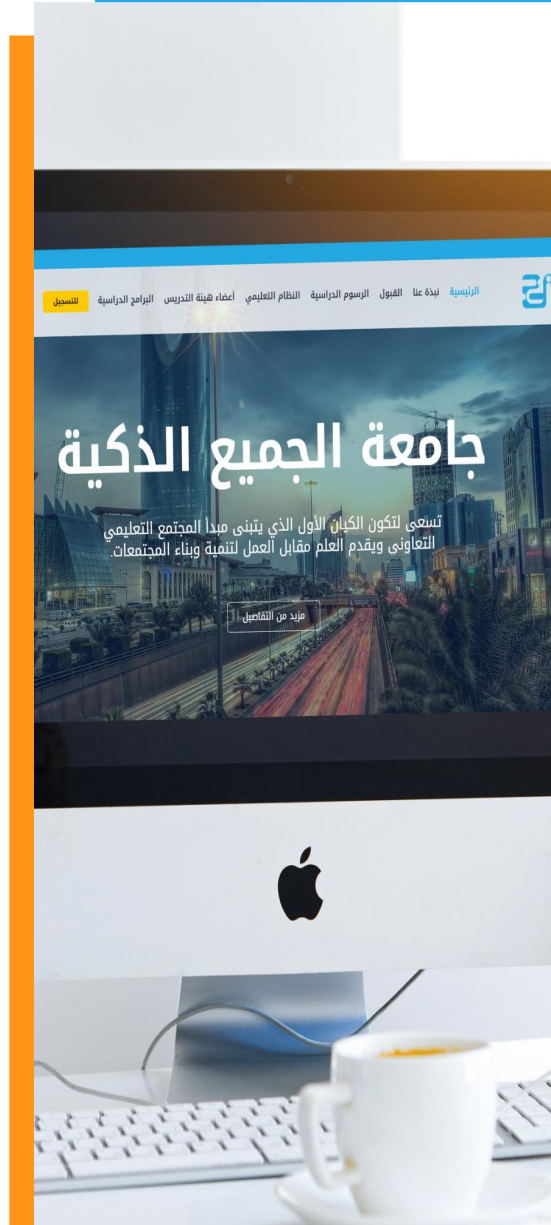
Construction is the foundation of the built environment industry and contributes significantly to the GDP. Construction is unique from all other industries and therefore warrants a unique approach to cost accounting. Smaller contractors may employ outside accounting services which include certified public accountants. Most contractors employ a combination of internal accounting personnel but still retain the services of a certified public accountant for audits and taxes. Depending upon the job size and location and contract terms, cost accounting and cost engineering may be performed either at the jobsite or in the home office. Contractors can be organized in a variety of different business formats including proprietorship, partnerships which may include general and limited partners, C and S type corporations, limited liability companies, and joint ventures. Most of the larger commercial general contractors are organized or incorporated as type C corporations. There are four different methods utilized for construction cost accounting including cash, accrual, percentage of completion, and completed contract.



- The choice of which one to use depends upon a contractor's size, organizational structure, and area of specialty. There is not one best legal structure or accounting system for all contractors; they all have their advantages and disadvantages under different circumstances. There are many reasons to perform cost accounting including measuring and monitoring internal financial success.



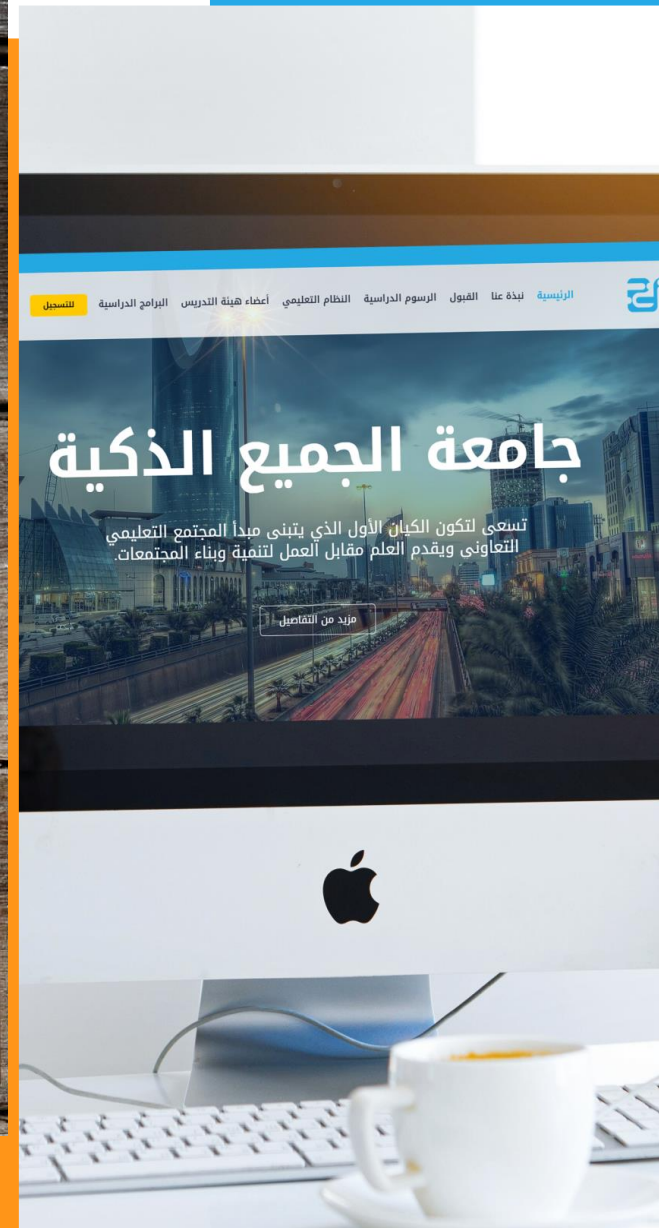
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Thank You



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Chapter 01

Introduction

