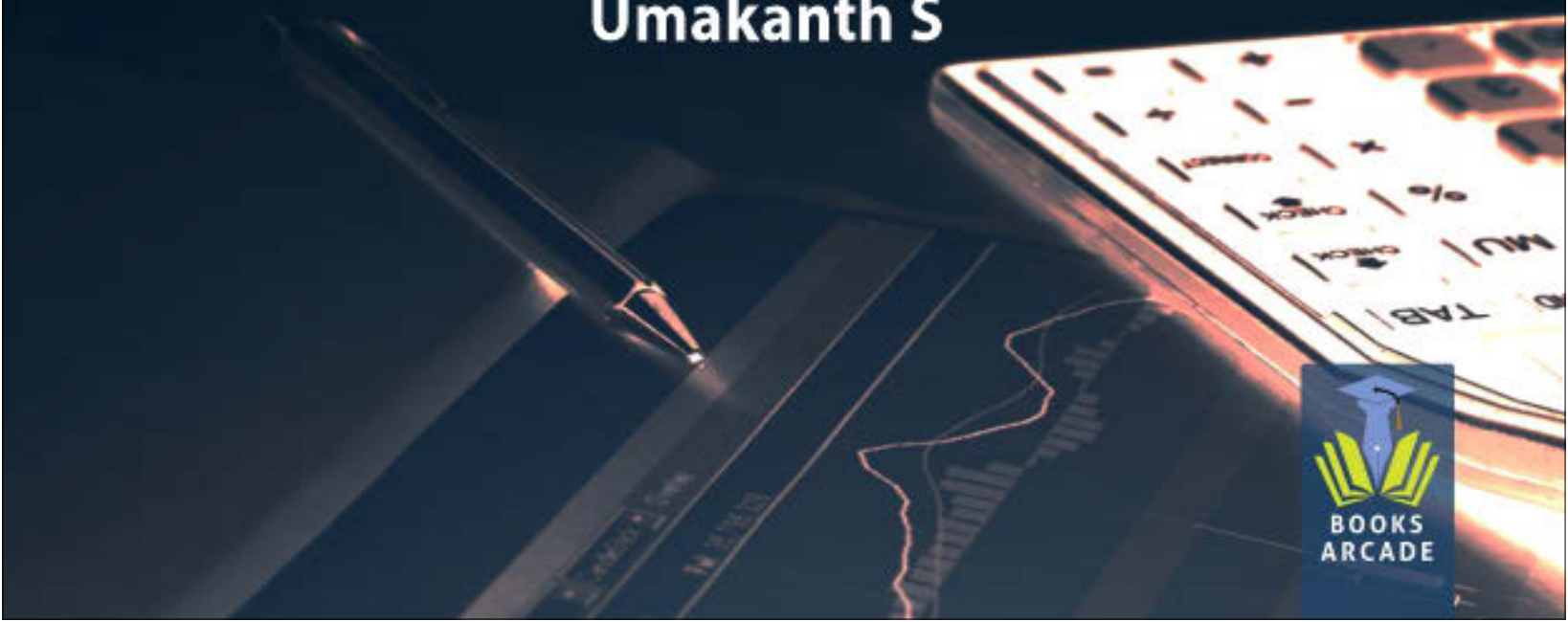
PUBLIC FINANCE AND ACCOUNTING

Dr. Preetha Chandran
Umakanth S



BOOKS ARCADE

Public Finance and Accounting

Public Finance and Accounting

Dr. Preetha Chandran
Umakanth S

BOOKS ARCADE
KRISHNA NAGAR, DELHI

Public Finance and Accounting

Dr. Preetha Chandran
Umakanth S

BOOKS ARCADE

Regd. Office:
F-10/24, East Krishna Nagar, Near Vijay Chowk, Delhi-110051
Ph. No: +91-11-79669196, +91-9899073222
E-mail: info@booksarcade.co.in, booksarcade.pub@gmail.com
Website: www.booksarcade.co.in

Year of Publication 2023

International Standard Book Number-13: 978-81-19199-29-7

CONTENTS

CHAPTER 1
FINANCIAL MANAGEMENT

[1]Dr. Preetha Chandran, [2]Umakanth S
[1]Associate Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Professor and Hod, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]preetha.chandran@cms.ac.in, [2]umakanth@cms.ac.in

Project managers and engineers are not often thought of as accountants.As construction managers (CMs), their duties often centre on the paperwork documents completed on the project to assist superintendents and subcontractors in the building-construction process. Also, although while many of the financial management tasks carried out on the worksite aren't considered to be "accounting" per se, they do come within the purview of cost accounting, particularly when we add financial management to the term. Also, everything that is done on the worksite is linked to how the construction company's home office operates. It is crucial that jobsite managers comprehend why they manage finances and how that management connects to how the home office accounting department operates. The focus of this book is on the financial operations of the construction jobsite team and how they interact with the accounting requirements of the home office. It is not intended to be a repetition of standard business school accounting textbooks or accounting courses; there are many excellent ones available. Cost accounting, especially building cost accounting, has been extensively studied.

While there are numerous purely academic studies on project management, including construction project management, the study of construction financial management as a whole is what holds these two areas together. In addition to cost accounting, financial management covers a wide range of advanced CM topics, such as activity-based costing, lean construction methods, the time value of money, taxes and audits, and the developer's pro forma. Financially closing out the construction project is another important CM topic.Construction is a dangerous industry. Every year, there are a lot of construction disasters, particularly with new, smaller firms. Considering just one year may be too narrow a focus given the many facts and indicators available, but generally speaking, 70% of contractors who are in operation on January 1 of any given year will fail within seven years. Construction firm owners or investors anticipate a very high rate of return (ROR) on their investment since the industry is so risky. They would be better off placing their money in a bank where it is protected by the federal government and receiving a fixed interest rate if all they could obtain for their first out-of-pocket investment in the firm was 1-2%. Contractors must be aware of and take control of their financial and accounting risks in order to earn a satisfactory ROR.

There are several reasons or indicators that a contractor may be in danger of failing financially. The internal owners of the business should be aware of these warning indications, as should any external strategic partners or stakeholders, including the contractor's bank and bonding firms, among others. The absence of a sound financial management strategy or system is the first and most obvious warning that financial difficulties may be brewing. A contractor may be in financial trouble if, among other things, their financial management system is ineffective, they have borrowed the maximum amount allowed under their credit line, their estimating procedures and results are subpar, their project management staff and systems are ineffective, they lack an adequate business plan, and they have issues with both

internal and external communication. Contractors often believe that increasing their volume or overall income would take care of all of their financial issues. This may not always be the best option. There are several factors that influence a contractor's decision to undertake construction work or their perception of their

Financial ability to do so. They may decide not to bid on a new building project for a variety of reasons, including the following:

Contractors still need to have enough positive cash flow, particularly early in the project, even if they are not required to supply the construction credit, as will be detailed later;The contractor has enough bonding capacity, which is crucial for projects subject to public bidding; There are workers on the payroll who are qualified and available who are prepared to begin a new project; The contractor has instant access to the essential construction equipment; Estimators, schedulers, and cost accountants are among the professionals who are sufficiently staffed in the home office overhead to assist the project team. They perceive a chance to charge a fair price; The contractor already has a good connection with the client or is interested in developing one, and they have a good relationship with the architect or engineer or are keen in developing one; The contractor's responses to all of these questions, which influence their choice to pursue a project, also have an effect on the business's finances and accounting methods, both in the home office and on the worksite.

Accounting objectives

A contractor should set up a proper cost accounting system at the worksite as well as at their home office for a number of reasons. Four of the most no ones are as follows:

1. Generate financial accounts for both internal and external use
2. Handle cash-in (revenue) and cash-out (expenditures)
3. Prepare and file taxes in accordance with federal
4. State and local tax laws

For contractors' financial management and cost accounting, consistency is crucial. From year to year, project to project, and month to month within each project, their financial reporting tools must remain constant. Contractors must have solid financial management processes in place, especially with regard to cost control, in order to reliably report expenses and predicted profits. This book's chapters go into great length on the crucial subject of cost management in construction. Particularly in relation to worksite cost accounting, it's critical to differentiate between cost reporting and cost management. The main question is: Does the worksite team really have cost management, or are they only reporting costs? And can they really "control" what the construction workers operating in the field are doing, or are they just trying to "manage" the process so that the workers can complete the estimate? The majority of textbooks on cost accounting and construction management limit their discussions on cost control to cost reporting. But, if changes are not made to the procedures in a timely manner, the worksite management team will not be able to control expenses or even enhance the bottom line. The building project team must adhere to a few fundamental principles to have an efficient cost management system:

Data used in cost reporting must be current and correct. The worksite team won't benefit from the outcomes if correct real cost data wasn't entered into the accounting system. The Pareto 80-20 rule states that 20% of a project's construction activities account for 80% of its expenditures and risks. The staff on the worksite should concentrate on the riskiest tasks.

The 80-20 rule is discussed in more detail throughout this financial management debate.

The contractor's field supervision, including superintendents and foremen, should be given access to the initial estimate and time. They need to have been provided the whole picture so they can plan and carry out the task. There are several instances of poor construction cost accounting, particularly when it comes to cost management. Several of them will be discussed throughout the book. There are also a couple excellent ones thrown in. To help you get started, consider these two examples:

Getting started with the constructed environment

All built environment initiatives include three main parties. How these many businesses may set themselves up and enter into agreements with one another to complete building projects at various times is described in, "Introduction to construction management." Clients, sometimes known as project owners or just owners, designers, such as architects and various kinds of engineers, construction managers, and/or general contractors are all components of any project. There are a lot of consultants and subcontractors who work under these three main players or report to them.

The certified public accountant is one sort of consultant who interacts on several levels of cost accounting and may assist all built environment (BE) participants in organizing their financial records, particularly in preparation for taxes and audits.

Sectors and styles of construction

Construction projects may be divided into many sectors according to the kind of building or the intended use of the facility. Examples of several general construction industry sectors include the following:

Commercial, which also includes stores, offices, churches, fire stations, and schools.

Movie theatres, bowling alleys, and restaurants are examples of commercial entertainment and hospitality. Residential construction includes the building of individual spec homes and bespoke homes. Residential structures also include condos, senior housing, motels, and flats, particularly if they are constructed of wood since they use comparable building materials and construction techniques:

1. Bridges
2. Roads
3. Utility projects are examples of heavy civil projects

Industrial projects, such as power plants, utility treatment facilities, refineries, and others, are highly specialized. For example, a downtown high-rise hotel with subterranean parking, a restaurant, retail space, and luxury residences on the upper floors are examples of hybrids or mixed-use complexes (MXD). Many construction firms classify themselves as commercial, residential, civil, or industrial contractors, specializing in one of these sectors. Some contractors may work in two industries simultaneously or in parallel. For instance: As the materials and construction methods are comparable to those used to create office buildings, commercial contractors may also build hotels or high-rise residential flats. High-end custom house divisions may be part of certain commercial contractors' businesses. In order to contract work internally, commercial contractors may also have a real estate development division.

Few civil contractors would develop residential projects, while some civil construction firms may also have a commercial section.

Subcontractors that specialize in one or more aspects of the job, such as a roofing

subcontractor or a landscaping subcontractor, are known as specialty contractors. Similar to general contractors, specialty contractors operate within each of these areas and may focus on one or more of them.There may be many cost accounting and financial management apps for many of these industries and/or sectors.

Accounting supervisors

"Introduction to construction management." The book defines each of these individuals' roles, making it clear whether they work mostly from home or on the workplace. The chief executive officer (CEO), chief financial officer (CFO), and the CFO's supporting accounting department make up the home office team in terms of cost accounting and financial management.

Positions like controller or comptroller, bookkeeper, payroll clerk, accounts payable clerk, accounts receivable clerk, and others may be included in the accounting staff. The project manager and the site supervisor are in charge of the worksite crew. The superintendent and PM, who are also referred to as the cost accountant or cost engineer on the worksite, employ foremen and project engineers, respectively. Contractual provisions will affect who works in the home office or the field and, maybe, what their titles may be on a given project.

Cycle of Accounting

The ensuing chapters will cover all of the many procedures and functions that make up the cost accounting cycle, including how they interact with cost control and building phase phases. Be aware that there are several connections between the cost engineering performed on the project and the home office accounting process. The following chapters' underlying principles for cost accounting contain some of the following steps:

Research case

One significant construction project will serve as the basis for many of the examples, s, and exercises utilised throughout this course and will be used as an integrated case study. This case study will go through several of the chapters, tying together the concepts of worksite project management and home office cost accounting and financial management. The participants and project name have been made up just for this book and are fictitious. Any resemblance to a genuine construction project or actual construction participants in any element of this case study is accidental. The following is a list of some of the project's specifics. On the resource, you may find more material including a project organisation map, a full estimate, and a detailed time.

Accounting procedures

The book, the built environment (BE), our case study, fundamentals of accounting, and the worksite as an alternative to a home office accounting and financial management strategy were all brought to the reader in the last chapter. This offers a further introduction to accounting fundamentals, explaining how the construction industry varies from other sectors and justifies its own distinct method of accounting.

One of the greatest businesses in the United States is construction, which generates around $1 trillion ($1,000,000,000,000) in gross domestic product yearly (GDP). That many zeros is a lot! This explores the four main accounting procedures and how they are impacted by the ownership arrangements of construction firms. Accounting is carried out for both internal and external stakeholders, and one use of accounting is to guarantee the safety and appropriate management of the contractor's assets.

Accounting-related specifics of the construction sector

The mass-production industries of food service, retail sales, and vehicle manufacture vary significantly from the construction sector in many ways. These variations necessitate that contractors handle accounting and other aspects of financial management differently. Below is a list of a few of such differences:

Construction is a project- or job-based industry. The accounting department assigns a unique work number to each construction project as soon as the contractor receives word from the customer that it has been awarded. Each project is handled separately by project teams, who include the Project Manager (PM) and the superintendent, and is seen as a distinct source of revenue. Some sectors produce repeat items and are product-based rather than project-based. For example, a pizza restaurant may produce 10 distinct kinds of pizza and cook 50 of each type on any given Friday night. They are quite unlikely to be aware of the prices of those individual pizzas. Every building job is different. The majority of construction firms provide a range of products. Even speculative house builders, sometimes known as track developers, provide changeable goods. 200 houses may be constructed in a tract development with five distinct floor plans, but purchasers are given a variety of exterior and interior finishes to make them feel special. They may construct 150 houses on the next tract using seven distinct designs, each different from the options available in the first tract. And each of them is situated on a different construction lot. Each building project makes use of hundreds of different materials and pieces. Very little inventory or leftover supplies are kept by contractors. Speculative house builders could complete a few homes before they sell them, but they work hard to avoid going overboard. Decentralized construction initiatives exist. The construction sites for each project vary; none are close to the contractor's place of business. Each building project employs a distinct crew and various construction tools. U The cash flow position in the construction business is inconsistent. Cash flow is defined as the amount of money entering the business each month in the form of payments from clients, and cash leaving the business in the form of payments for labour, materials, and subcontractors. U In order to ensure that the contractor completes the job, the customer often holds 5 or 10% of each pay request for building projects. This is comparable to holding back $2,000 from a car dealer for a few months to ensure that your vehicle performs as promised.

When you leave the cash register after purchasing a hamburger, the transaction is finished. This is a temporary agreement. Long-term contracts for construction projects often run six months to a year or two, and project/product warrantees typically last an additional year or more. Builders in the construction industry sign a contract and agree on the selling price or total cost of the project, but they haven't spent any money yet and won't know how much it will cost until the project is finished. When you purchase a shirt at the clothes shop, they want full payment up front. Construction of speculative homes is comparable. Yet, the majority of construction-related activities depend on submitting partial monthly invoices to clients and scheduling monthly payments throughout the course of a contract. 80–90% of the work is completed by speciality contractors or subcontractors, according to general contractors (GCs). About all of the work may be subcontracted out by construction management firms. Imagine purchasing a basket of French fries when each of the 30 fries comes from a different restaurant, with a different chef using a different deep fryer. Then the burger place where you were buying the fries gathered them all together and gave you an order for them. There will be a varied combination of craftspeople and subcontractors for every building project. Extremely small home renovation companies may utilise the same artisans and subcontractors on each job, but each of those projects would have a distinct scope, be completed at a different location, and be for a new customer.

Accounting techniques rentals, construction locations, climatic circumstances, buildings constructed on the same dates in the same year, and so forth. Even the next example was different.

Accounting for Construction

For construction enterprises, accounting may be done in a number of ways. Contractors may use a variety of accounting services, such as: Some contractors outsource their accounting to businesses run by certified public accountants (CPAs), who handle all bookkeeping with little to no assistance from the contractor's internal accounting staff. Only extremely new or tiny contractors would experience this. Many contractors have an internal home office accounting department with bookkeepers, clerks for accounts payable and receivable, payroll, a controller or comptroller, and sometimes someone in charge of maintaining the equipment ledger and accounting for construction equipment. These divisions are often led by a chief financial officer (CFO), while smaller businesses may have only one accountant handling everything under the direction of the CEO, who then uses an independent CPA for tax and other external reporting. In particularly big construction projects or cost-reimbursable open-book projects that will only pay for accounting assistance while it is on the worksite, jobsite accounting is often only done. The worksite team's financial management duties extend beyond accounting to include cost control, pay requests, financial close-out, and other topics covered in this book. The project manager (PM), superintendent, project engineer (PE), and sometimes a worksite cost accountant or cost engineer make up the jobsite financial management team.

The case study and examples used throughout this book have been based on this circumstance. The emphasis will be on project-specific accounting and financial management tasks carried out on-site while maintaining a connection to management from the home office. As was said here and below, there are several reasons why the construction industry is dangerous. To manage such risks on behalf of the business they are representing, it is the responsibility of each worksite PM and supervisor. Both the home office and the worksite staff make use of various financial resources. Some of these are created at the worksite, while others are created at the home office, sometimes with assistance from the jobsite crew. Not necessary that you will be able to make them yourself, but developing a broad grasp of accounting procedures of these financial reports and processes and their relevance is one of this book's goals. The jobsite team's main objective is to control worksite expenses and provide a reasonable profit for the company. Similar to how a hammer is an essential tool for a carpenter, managing cash flow is an essential construction management tool. The worksite level manages cash first, followed by the corporate level. One of the main causes of contractor failures is a lack of sufficient financial flow. An essential subject covered in this presentation is cash flow. Several built environment players use various words for various objectives. Some college textbooks, such as those on accounting and construction management, also differ to some extent, particularly when it comes to job names. In relation to building cost accounting and financial management, some of the many words and roles include:

The CEO or President of a construction company may be the boss or owner, but the jobsite team may also report to a variety of other officers, such as the officer-in-charge (OIC), chief operations officer (COO), senior project manager, and others who are also covered in the next chapter, Introduction to construction management. The CFO and CEO are home office financial managers and general managers. The accounting team already mentioned as well as staff estimators, staff schedulers, specialised superintendents, quality control officers, safety control officers, human resource managers, marketing directors, and others are examples of

home office staff support personnel. The superintendent, PM, PE, and the on-site cost engineer or accountant make up the worksite team or management team.

Ownership Arrangements of Construction Companies

Project owners, architects, and other members of the built environment business, such as general contractors and subcontractors, may be either people or corporations. Sole proprietorships, partnerships, corporations, limited liability companies, and joint ventures are the most typical types of business entities. Every business engaged in construction, such as the customer, general contractor (GC), subcontractors, and design firms, has a "owner" or "owners" or "equity partners." The way a company is structured has an impact on the decisions it makes, the tasks it assigns, the profits it makes, the risks and liabilities it assumes, and the tax obligations it must pay. These discrepancies have an influence on how the contractor approaches cost accounting and the financial management of the construction company. Throughout our instances, this book will make an effort to differentiate between the project owner and the ownership of the construction company. The ownership of construction businesses is discussed in the coming paragraphs, not necessarily the ownership structure of the client.

The most prevalent kind of company functioning in the built environment is a sole proprietorship. Since they are simple to establish and run, proprietorships which are businesses owned and run by a single person, the proprietor are quite popular. As a result, there is no difference between the company and its owner, who is entitled to all profits and is solely accoun for the acts of the company. Depending on the state with jurisdiction, several conditions must be met to establish a proprietorship. The owner must get all business licences and permissions necessary to run a construction firm. A single carpenter, for example, may run a modest deck-building firm, but would still need insurance, bonds, and a business licence.

Accounting procedures that are prescribed by the legal system in which he or she works. It is simple, although not always a good idea, for the owner to combine revenue and costs from the firm with those from other personal sources. Combining work and pleasure may have unfavourable tax effects. Flexibility is a further benefit of running a lone proprietorship. The proprietor decides on the direction the company should take, development and expansion prospects, and the timing of choices and actions. One individual makes all of the decisions for the lone owner. On the other hand, the owner of the firm has the right to decide at any moment whether to limit or slow operations, close it down, or sell it. The drawbacks of running a proprietorship include its limitless personal responsibility, its difficulty in getting capital to expand and/or run the firm, and its one-person decision-making process.

Partnerships are companies where two or more people control a portion of the firm. The initial investments made by the partners in the firm might be made in the form of money or assets, such construction equipment, and more investments could be made during the course of business operations in the form of time and/or assets. A partnership has a strong relationship with its investors, just as a sole proprietorship does. Similar to a sole proprietorship, profits are distributed equally among the partners and taxed together with other personal income. A partnership, on the other hand, is a separate legal organisation that has the ability to independently own real estate, recruit staff members, and bring (or be brought into) legal action. The shares do not have to be split equally between the partners. It's possible that one partner provided 75% of the initial firm stock while the other provided 25%. Profits would subsequently be split between the two according to these similar percentages. General and restricted partners are the two categories of partners. Shared responsibilities and commercial gains and losses apply to general partners. General partners will equally split

those profits, liabilities, and management responsibilities unless otherwise stated. Limited partners do not take part in the day-to-day management or operation of the company; they simply provide assets. Limited partners do not share in business liabilities beyond their original investment in exchange for their little engagement. A partnership may increase funds by adding limited partners while ensuring investor personal immunity and total authority for the general partner. A minimum of one person must be listed as a general partner in every partnership. Partnership transfers may be complicated if a partner passes away, has a dispute with the other partners and wants to end the business relationship, or gets divorced and the other partner wants to keep a 50% ownership stake in the building firm. There are two distinct corporate types: type C and type S. Shareholders own Type C companies, sometimes known as just "corporations." Smaller businesses that started as sole proprietorships or partnerships might "incorporate" to become corporations. By incorporating a firm as a corporation, the construction company's stock ownership may be legally separated from the management and operations of the business, limiting the shareholders' exposure to only their original investment. A board of directors is chosen and overseen by shareholders and is comprised of officers such as a CEO, COO, and CFO. Equity owners in a corporation are often officers and engaged in the day-to-day management of the construction firm in exchange for a wage.

The corporation will often pay a lower tax rate than a proprietorship or partnership, particularly at extremely high revenue levels, which is another reason a contractor could want to incorporate. Businesses that are corporations file taxes separately from their stockholders, unlike sole proprietorships and partnerships. Corporate tax rates, which are often lower than personal income tax rates, are used to tax a corporation's profits. Dividends are profit distributions that are made to shareholders if management chooses to do so. These dividends are subject to a second Federal income tax on an individual basis. The general contractor used in this book's case study of the Olympic Hotel and Resort is Evergreen Construction Company (ECC), which is set up as a type C business.

Smaller, tightly owned Type S firms often have fewer stockholders. They are often brand-new or startup construction firms that eventually become C corporations. One benefit of a S corporation is that profits are not subject to double taxation and the business is taxed at individual rates, which are lower for individuals with lower income levels.

Limited liability companies (LLCs) combine aspects of partnerships and corporations. Members of an LLC are sometimes referred to as the owners. A LLC would restrict personal responsibility from ownership, much like a corporation. A LLC would prevent double taxation by distributing all of its profits and losses among its members, just as a partnership does. The organisation of several real estate development projects as distinct, unique LLCs protects the development firm and equity partners from failure on any one particular project. The last of this book discusses real estate development businesses and their financial pro forma. Business entities called joint ventures (JVs) resemble general partnerships. The primary characteristic of a JV is its transient scope since it is only established for a brief time or for a particular building project. The major justifications for establishing a JV on a construction project are to distribute risk and pool financial, physical, and/or human resources. For instance, joint ventures amongst construction firms that pool their staff, assets, and bonding capacity while distributing failure risk are used to build many significant infrastructure projects.

Techniques of Construction Accounting

While you won't necessarily be engaged in the accounting procedures and techniques used by the CFO and the home office accounting department, you should be aware of some of the key

challenges. Construction contractors may choose from four fundamental kinds of accounting procedures: cash, accrual, percentage of completion, and finished contract. In turn, each of these four approaches will be discussed in this section. They vary in how they handle and when they recognise income and expenses, or when they "account" for money. The percent complete and completed accounting techniques are ideal for construction organisations with projects lasting more than one or two years, whereas the cash and accrual accounting systems are more appropriate for short-term construction projects, those lasting less than one year. The actions required to bill a customer for services rendered and get revenue in the form of payment are included in accounts receivable. Accounts Payable refers to promises made to handle payments for labour, supplies, and subcontracts for completed construction work.

CHAPTER 2
CASH ACCOUNTING

[1]Dr. Vinoth.S, [2]Raghu G Anand
[1]Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore,Karnataka, India
[2]Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.vinoth@cms.ac.in, [2]raghuanand@cms.ac.in

The cash accounting technique is often only used by smaller contractors, such as those with annual firm volume of less than $5 million. The cash technique is used by around 80% of construction enterprises with 10 or less workers. While tangible money is not used by contractors when they work on projects, the phrase "cash" refers to a physical exchange of checks or an electronic debit transfer from a bank account. The cash technique is quite easy. The average fiscal year for contractors is from January 1 to December 31. When a customer writes a check, it is recorded as revenue when it is deposited in the bank. A check made out to a subcontractor is recorded as an expense. For either to be reported, the checks themselves do not need to clear the bank. This approach does not take into account work completed but not yet invoiced, pay requests billed to a customer but not yet received, or invoices from subcontractors received but not yet paid. The cash accounting approach reflects very erratic financial flows. The Internal Revenue Service (IRS), equity partners, CPAs, auditors, and others who demand consistency in financial reporting may have issues as a result of this irregular revenue flow. In order to delay tax responsibilities at the end of the year, the contractor has the option of either depositing a client check in December or retaining it until January. Although though subcontractor bills may not be due until January, the contractor may process them early in the month to provide for tax deductions this year by pushing costs and expenses ahead. Designers and consultants including architects, engineers, inspectors, and agency construction managers also like the cash system.

Accrual

Revenues are reported using the accrual accounting technique when they are invoiced or generated and turn into accounts receivable, albeit not always when they are actually received. Retention kept by the customer is not recorded as revenue until after the project has been completed. As expenditures are incurred and subcontractor invoices are generated and entered into the accounts payable system, expenses are documented. Compared to the cash approach, the accrual technique provides a more consistent financial reporting trail. Similar to the cash approach, the accrual technique is often only applicable to smaller contractors with $5 million or less in yearly volume.

Percentage of Success

For commercial contractors with a volume larger than $10 million and/or long-term contracts that may extend beyond two years and cross over into additional fiscal years, the percentage completion technique is advised. It is seen as a more reliable and constant indication of revenue. This accounting approach only summarises the proportion of completed construction projects that a construction business has at the conclusion of its fiscal year. Reporting the percentage of actual expenditures expended and the proportionate amount of profit made achieves this. This is a summary of the percentages finished on each project for a construction business with several projects. This is comparable to billing based on a

previously determined schedule of values, which will be covered later. Similar to accrual accounting, the percentage of completion accounting method also records the retention after the project is finished. Bigger architects and engineers may also use financial reporting based on % completion. The case study in this book will be based on the percentage of completion technique.

Finished Contract

Much more irregular than the cash basis is the full contract accounting technique. In this situation, contractors do not record any income or expenses until the job is finished and they have been paid. Small general contractors that are paid in full upon completion, including those who work on renovation projects and speculative house builders, may adopt this technique. Residential tract builders are business owners that construct and resell houses for profit (also known as spec home builders). In essence, they are property developers. According to the completed contractual accounting approach, worksite administration costs and home office overhead are pro-rata allocated to projects, and expenditures are recorded when revenues are received, at project completion, with an eye towards any potential tax repercussions. Based on the timing of building starts or changes in the economy, a home builder may sell ten homes one year and only two the next, therefore revenues may shift significantly from one year to the next when using the completed contract accounting system.

Internal Controls on Finances

As was briefly mentioned in 1, there are a variety of reasons why construction cost accounting is used. Reporting net income and paying taxes are two significant external justifications for keeping track of revenues and expenses. There are many internal factors for accounting as well, which help in managing the business's financial affairs. Among these is the calculation of profits and their net impact on investors' equity, or return on equity (ROE). As was said, building products are diverse rather than repetitious. The contractor may diagnose his or her own level of industry specialization using internal financial statistics.

Moreover, contractors may use internal accounting, or audits, to gauge the effectiveness of their most valuable resource: their workforce. Construction is a project-based industry, and each project has a project manager and supervisor who must make a reasonable profit for the business. To make sure that teams at the worksite and the corporate headquarters are appropriately managing the company's finances is another reason why contractors do internal accounting management. On the worksite, the superintendent is responsible for a number of financial management duties, many of which will be covered in this book. The supervisor is responsible for the safety and security of the workplace as well as the protection of building materials from the elements and external theft. While not frequently seen as financial problems, if these factors are not effectively handled, project costs will suffer. While it's rare, inside financial theft may happen. A contractor may prevent internal financial theft in a number of different methods. A few of them are:

Construction Administration

To provide a quick rundown and introduction to contemporary construction management (CM) procedures, this has been included with other Cost Accounting and Financial Management subjects. Before delving further into the accounting of construction, it is crucial to expose the reader to a few basic CM concepts and procedures. Both the following introductory on estimating and this on CM are not intended to stand alone as treatises on those extremely significant subjects. Each of them needs its own book or course focusing just on those topics. The link between project management, estimating, and other CM subjects as they pertain to worksite cost accounting and financial management is the main theme of this

article. The function of the project manager (PM) as a human is the emphasis of construction management in this context. Several ideas and expressions from one (CM or PM) may be used in the other. Together with many other members of the built environment (BE) team, the CM and the PM are both builders. The word "builder" is too ambiguous; everyone involved in the project—including the owner, architect, general contractor (GC), and craftsmen contributes to the construction process and is, in and of themselves, a "builder." In the outset, the owner, architect, general contractor, and craftspeople were all one and the same; they were the builder. Among other things, the ancient builders had ingenuity, resourcefulness, intuition, and problem-solving skills. They just "knew" what was necessary to complete the task. Owner and builder, or master-builder, later divided into two distinct roles. The owner created the demand, and the builder met that need with a structure or a house in this instance. Similar to the modern design-build (DB) delivery system discussed later and the master-builder at that time served as both the designer and the builder.

The divide between the builder and the designer came next. The builder would develop into the general contractor or construction management firms of today. Later, the design component would be divided into engineering and architecture. Each of them has been mentioned subsequently and presently each has several sub-divisions. Within the GC's structure, there are several other degrees of expertise, which will be covered later.

The three main players in any organisation or delivery method used in the BE, as will be covered in the following section, are the project owner, also known as the client or the project manager, the lead designer or architect, and the general contractor or construction manager. A significant number of other BE participants are specialty engineers and consultants, such as waterproofing or elevator experts. Here is a list of several of these: The delivery and procurement strategies the client choose to utilize, as well as the price and contracting alternatives the contractor must take into account, are all described in this chapter. Furthermore addressed are many general construction organisation types, the function of project management, and project managers' responsibility for assessing hazards in connection with possible building projects.

Delivery and purchasing procedures

The project owner or client, the designer (an architect or engineer), and the general contractor are the three main businesses and/or people who bear the principal liability in any construction project. The project's delivery approach determines the connections between these players. While the owner chooses the delivery method, it affects the duties of the contractor's worksite team, particularly their financial duties. Based on their expertise and the level of risk they are ready to take on themselves or transfer to the general contractor (GC) or design team, the project owner chooses a delivery method. The four most popular delivery techniques are examined in this section. The GC's worksite project management processes, including cost accounting, will be affected by each of these various arrangements. The four key design stages, which correspond to different delivery and procurement alternatives, are also presented along with the fundamental distinctions between the bid and negotiation procurement procedures.

Standard general contractor delivery

The classic approach of project delivery is the most typical technique and is shown in the straightforward organization structure. The general contractor and the designer are parties to distinct agreements with the owner. The designer and the GC are not parties to any contracts. With this delivery technique, the design is often finished before to hiring the contractor. The project manager for the GC makes it a point to gather the project drawings and specifications,

provide a cost estimate and construction schedule, set up a cost control system to oversee financial operations throughout construction, and oversee the site office. A typical general contractor (GC) works with both direct artisans and subcontractors. The exercises in this book and the hotel case study are based on the conventional GC delivery strategy.

Delivery of Construction Management

There are two fundamental delivery mechanisms for construction management. The agency CM is one, and the at-risk CM is another. Contrary to the mix used by the typical GC as previously mentioned, the agency CM uses neither direct artisans nor subcontractors, and the pure at-risk CM employs only subcontractors. Under the agency construction management delivery approach, the project owner has three different contracts (one with the designer, one with the general contractor, and one with the construction manager). The CM works with the designer and the GC to manage design and construction concerns on behalf of the owner. The designer and the general contractor (GC) are both hired by the CM, who typically receives the first contract. The GC is often not recruited for this delivery approach until the design is finished. Similar duties to those stated for the conventional delivery method are carried out by the project manager for the GC. The main distinction is that, unlike the conventional approach, the agency CM, often referred to as the owner's representative, is the point of contact for the GC's PM rather than the owner. This form of the CM has no financial risk since the building expenditures are not recorded in the agency CM's accounting books.

The owner has two contracts—one with the designer and one with the construction manager—under the construction manager-at-risk delivery method. The construction manager/general contractor (CM/GC) delivery method is another name for this approach. The designer is often employed first in this situation, but the CM/GC is also engaged early in the design development to provide a number of preconstruction services, such as cost estimation, constructability study, and value engineering studies. The project is built by the CM/GC when the design is finished. Construction may start in certain circumstances before the full design is finished. Fast-track or phased construction is what this is. After construction begins, the project manager for the CM/GC coordinates with the designer, oversees the completion of preconstruction work, and takes on duties akin to those in the conventional system.

Design-build delivery

According to the DB delivery method shown project owner has a single contract with a design-build (DB) contractor that covers both the project's design and construction. The DB contractor may decide to form a joint venture with a design company, employ a design firm to create the design, or have a design competence inside its own organisation. With fast-track techniques, construction may start early in the design phase, or it can wait until the design is finished.

The project manager for the GC handles both the design and construction while interacting with the owner under this delivery style. This approach is extremely similar to the prehistoric master-builder idea covered previously in this chapter. Other DB versions, such as the following, increase the contractor's engagement throughout the building's lifecycle:

Other delivery techniques abound, some of which are fusions of these four. Under the relatively new idea of integrated project delivery (IPD), all three main parties sign the same contract and are responsible for the same risks. The section on "Lean building practises" in includes an example IPD organisational chart. The project owner enters into simultaneous contracts with a number of general contractors or significant subcontractors when using the five primes or multiple-prime delivery technique. Site work contractors, building shell and core contractors, tenant-improvement contractors, mechanical contractors, electrical

contractors, and/or other contractors are often included in this. The multiple-prime delivery approach often necessitates that the project owner serve as their own construction manager. The term "public-private partnership" refers to another alternative distribution method (PPP or P3). With this procedure, the demands of a public customer, such as a university looking to construct a research facility, are combined with the resources of a private organisation, such as a real estate developer who may possess a piece of land. For the benefit of the institution, which will sign a long-term lease insuring the developer's pro forma will succeed, the private developer will construct and run the facility. With the P3 delivery approach, the often difficult and sometimes contentious lump sum bid procedure is not required of the public customer.

Procurement

Through either negotiated or bid processes, project owners recruit or hire members of the construction and design teams. Laws often compel public project owners to employ an open bidding procedure to provide all contractors an equal opportunity to win new business. Private owners are free to employ whatever form of procurement they like, including negotiation or bidding, although they often seek out contractors they have had success working with in the past. They may also ask a small number of contractors—or perhaps just one—to submit a bid or negotiated proposal. After submitting a list of qualifications that are appropriate for that particular project, both private and public owners may utilise a prequalification process to create a short list of contractors to either submit a bid or negotiate with. Prequalification lowers the client's risk of receiving a proposal from an unqualified contractor that is too low for them to effectively finish the job. Key suppliers and subcontractors may also be prequalified and verified, which lowers the risk for general contractors who are tendering. For the owner, architect, and contractor, there are disadvantages and benefits to both bidding and negotiating. A contractor selected for a private project under agreed terms will be used as an example case study and the starting point for many of the exercises in this book. Throughout this discussion of financial management, the word "book" or "books" is used. This relates to accounting or bookkeeping records. In essence, this comprises, among other things, the contractor's initial estimate, all financial accounts and reports, and actual cost data gathered over the course of construction. As the customer cannot see the contractor's precise estimates or expenses, bid projects are closed-books. When contemplating an open-book project that offers extra accounting backup for change orders, pay requests, and financial close-out audits, there is more to concentrate on with regard to a research on worksite cost accounting and financial management.

Drafting Stages

Not all project components are created at the same time; some components start sooner, some design is completed more quickly, and other components have more degrees of complexity. The majority of built environment projects go through five main design stages. Programming and conceptual design may sometimes be integrated into a single step, making a total of four stages. In terms of when the contractor estimates the project, when and how the contractor is selected, and when and how the contractor starts their cost accounting processes, these design phases have an impact on all of the other introductory construction management topics covered in this chapter, such as delivery, procurement, contracting, and pricing methods. The stages of design comprise: At each of these tiers, additional design definition and detail are added, enabling the contractor to provide estimates that are more accurate and to eliminate contingencies. Hopefully, this extra information will also lower the client's risks. Early in the design process, budget projections and negotiations with a construction manager or general contractor are more typical, whereas the completion of the final phase,

construction papers, is when the conventional delivery method and bid procurement procedure best matches up.

Pricing

In the construction sector, there are a number of ways for determining contract prices, but four of them are the most common, while others are combinations of these four. The owner decides which to utilise for every given project after assessing the risk involved and determining how much risk to take on himself and how much to transfer to the contractor. Contractors often raise their prices or include contingencies in their estimates as a way of compensating for the risk they take on. The most typical techniques of pricing include: Contracts that are granted based on a single lump sum estimate for a certain scope of work are known as specified sum or lump sum agreements. For large-scale civil projects when the precise amounts of work cannot be determined, unit-price contracts are used. The contractor sends unit costs for each work item, and the designer estimates the total amount of work. The final contract price is calculated when the project is finished by multiplying the needed installed quantities by the bid unit pricing. When it is impossible to define the whole extent of the task, cost-plus contracts are employed. The owner covers all of the contractor's project-related expenses, and a fee is charged to offset profit and contractor home office overhead. A time and materials agreement is another name for this. A cost-plus contract with a guaranteed maximum price stipulates that the contractor won't charge more than a certain amount.

Many factors, such as the degree of design completion, the complexity of the project, and the owner's prior experience managing construction projects, influence the technique that project owners pick for their contractors to estimate a project's cost. Also, the impact of each of these pricing models on worksite cost accounting varies greatly. The hotel case study and examples in this book use the GMP pricing technique because it exposes the reader to a range of cost accounting operations that the other pricing systems, particularly lump sum, do not. A more thorough explanation of these contract pricing approaches is covered in many excellent project management and estimating books, such as MOCP, some of which are expanded upon in the on estimating that follows.

Contracts for construction

The most crucial construction document is the construction contract. It significantly affects how expenses are reported, particularly in open-book contracts. It is a legal agreement that outlines each party's obligations and rights, such as those of the owner and general contractor. A contract can only be established if five conditions are met:

The contractual agreement's purpose and the contract papers' descriptions of the finished project and the rules that the parties (often the project owner and the general contractor) must follow in order to complete the task. The order of the work or the techniques and methods the contractor will use to complete the project are often not fully described. The contractor is expected to possess the professional knowledge necessary to comprehend the contract agreements, choose the right subcontractors, skilled artisans, supplies, and equipment, and finish the project in a safe manner while meeting the needed quality standards.

For instance, the contract documentation will include the dimensions and sizes of structural steel columns and beams but will not include the design of any lifting or safety-related tools or erection aids, such as erection bolts or chairs. The following five crucial components are often included in the contract paperwork. The following papers are listed in what used to be thought of as a relative order of precedence, but now most people see them as complimentary; they all need to operate together:

The contract agreements alone define the terms and circumstances of the relationship between the principal parties. Before opting to proceed with a project, the contractor should read and fully comprehend these agreements. They serve as the foundation for developing a project estimate and timeline as well. The project manager must comprehend the structure of the contract agreements and the contractual requirements specific to his or her project in order to manage a project effectively. This information is crucial if the project manager (PM) hopes to meet both the project owner's and the corporate executives' expectations. The actual contract agreement is either a created document specifically for a certain project owner or project, or it is a general standard template. The majority of governmental organisations create building contract papers using standard forms. General conditions and contract wording are often standardised for federal and state entities. The American Institute of Architects (AIA) contract forms and the ConsensusDocs family of construction contracts, which is led by the Associated General Contractors of America (AGC) and other contractor groups, are both often used by private owners. Contracts must first undergo a comprehensive legal scrutiny before being signed. This is done to make sure that each party's obligations are spelled out in clear, legal terms and that the agreements may be enforced in court in the case of a dispute. Typical contract agreements are often created by lawyers, evaluated in the courtroom, and declared fair to the parties who knowingly sign them. The duties of the worksite project team and the accounting procedures are significantly impacted by the contract papers. The general and special terms of the contract include specific criteria. There are several possible combinations of delivery, procurement, pricing strategies, contract forms, and contractor organisational structures that might be used for a certain project, as demonstrated in

The contract agreements will define the various accounting consequences or regulations that the contractor must follow. More paperwork is needed for federal projects that make use of prevailing wages, as mentioned in, "Taxes and audits." Compared to negotiated contracts, lump sum agreements are often shorter. They do not compare reimbursable and non-reimbursable expenses since they are closed-book. The topic of cost reimbursement and non-reimbursement is extensively covered in open-book initiatives. Project managers, cost accountants, and cost engineers who are stationed on the worksite may be considered reimbursable expenses. Under AIA contract A102 for cost-plus projects with a guaranteed maximum price, reimbursable and non-reimbursable charges. The open-book project contract specifies the labour burden rates, the owner's ability to audit the contractor's books, the rental rates for equipment that may be rented, and the maintenance expenses that may be incurred. Closed-book lump sum projects are not subject to clauses. Change order markups will be specified in both closed-book and open-book contracts' contracts.

Project management

Project management is a process that involves applying information, skills, tools, and procedures to the many tasks necessary to effectively execute a project. It may also be a person or an organisation. The success of a construction project is often measured in terms of its cost, time, quality, and document control. The difficulty facing the construction team is finding a balance between quality, cost, and time within the framework of a secure project environment and documenting every component appropriately. In the built environment sector, safety is of highest significance to businesses and people. Sacrificing any component of safety in order to increase quality, schedule, or cost performance is unethical, risky, and unaccep to all parties and also The PMs and cost engineers for mid-sized commercial general contractors will be the focus of this book's context. Nonetheless, the ideas and methods covered apply equally to projects including residential, commercial, industrial, heavy civil, and infrastructure building. The project manager and superintendent have joint leadership

responsibility for the contractor's job-site project team. They are in charge of determining the project's needs and organising the team to see that they are all completed safely, within the planned spending limit, and on schedule. The superintendent focuses on the field installation side, while the PM concentrates on the office and field management side. The PM must organise his or her project team, create a project management and cost control system that monitors project execution, and deal with problems that crop up during construction in order to complete this difficult work. There are several more non-financial CM tools that a PM will use in managing a project, like as requests for information (RFIs), submittals, meeting notes, and others, that are covered in a comprehensive book or course on construction management. The Building Document Cloud, shows a lot of those features. The cost control cycle to be discussed in both overlap with the five primary stages of a building project. Planning or preconstruction, start-up, control, close-out, and post-project analysis are some of these stages. The project manager, superintendent, and top management assess certain project risks throughout project planning, especially those relating to safety, cost, quality, and time. Critical abilities necessary for effective project management include risk analysis and risk management. The PM creates the organisational framework required to run the project as well as the communication plan to be utilised with other project stakeholders as well as inside the project management organisation in Figure 2.1.

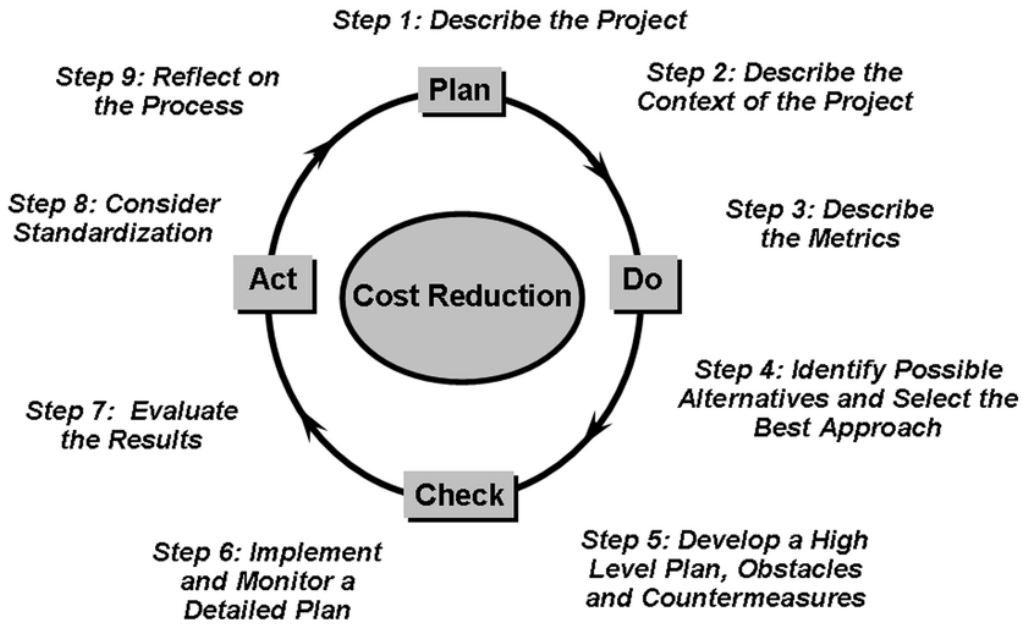


Figure 2.1: Illustrates the features of project management.

The project manager and superintendent organised the project management team at startup, inform them on the project and its dangers, and engage them in team-building exercises. Project cost accounting systems are started, and the project management office is formed. Establishing vendor accounts and starting the acquisition of supplies and subcontracts. To regulate every element of a project's execution, systems for managing costs, schedules, safety, and quality control are built. Project control is a general word that refers to "controlling" or "managing" the project while it is being built, interacting with outside team members, anticipating risks by taking steps to reduce possible repercussions, and modifying the project schedule to take into account new circumstances. The project manager keeps an eye on the quality control, cost control, and schedule control systems and, working with the superintendent and the worksite cost accountant on their project team, makes modifications

as needed. To check for deviations from projected performance, he or she develops or examines a variety of performance reporting tools. Next, they take appropriate measures to lessen the effects on the overall success of the project.

The project close-out process comprises submitting all necessary paperwork to the owner, finishing out the project's physical construction, and closing out the finances. To reduce worksite overhead expenses, the project manager must pay great attention to detail and inspire the project team to complete the project quickly. Goes into great length on managing jobsite overhead, and it also talks about close-out, specifically financial close-out.

If post-project analysis is done, it entails examining every area of the project to identify lessons that may be used in future endeavours. Analysis should be done on matters such anticipated time vs. actual schedule, quality control, supplier and subcontractor performance, choice of construction equipment, efficiency of communication systems, and labour productivity. Many contractors just move on to the next job after skipping this stage. Those that do post-project analysis gain knowledge from their endeavours and continuously hone their methods. The PM's close-out process or the newly implemented internal business audit may both contain the lessons-learned analysis.

Organizations that use general contractors

The size and organisation of a project's worksite is determined by the corporate culture and style, the project's size, complexity, and contract conditions, as well as the jobsite's location in relation to other projects or the contractor's main office. To keep the price of the contractor's construction operation comparable with other contractors, the cost of the project management organisation must be maintained low since it is considered worksite overhead. Indirect expenses are another name for the worksite overhead charges. The aim of creating a project management organisation is to provide the bare minimum of structure required to run the project successfully. If the project is exceptionally difficult, more technical personnel may be needed than would be necessary for a project of similar complexity. Technical personnel may be transferred across projects or backup assistance can be given from the contractor's home office if the project is close to other projects or the contractor's office. The jobsite office must be self-sufficient if the project is remote from the contractor's main office, as was the situation in our case study.

There are two ways that general contractors set up their project management teams. As shown in, one sort of project management idea involves staff experts doing estimating, accounting, and scheduling tasks at the contractor's home office. The project manager is in charge of estimating, accounting, and scheduling under an alternative organisational structure, the sole-source organisational style is used. The supervisor and the PM will both answer to a member of the officer corps or top management of the contractor. For the project to be successful, the PM and the superintendent must function as a cohesive team, each having their own areas of expertise. The corporate officers of the contractor, such as the CEO, choose the organisational structure for project management in Figure 2.2.

The project manager chooses the people to be allocated to each role after choosing the project management organisation for a particular project. While some employees may be employed from outside the contractor's company, most will be internal. The PM or senior company management may choose the project team members from inside the construction firm. The PM must assemble the team members into a cohesive unit after they have all been chosen. The PM and superintendent of the general contractor are in charge of team development, both with internal and external partners, and a more in-depth independent research on construction leadership has this topic as its main emphasis.

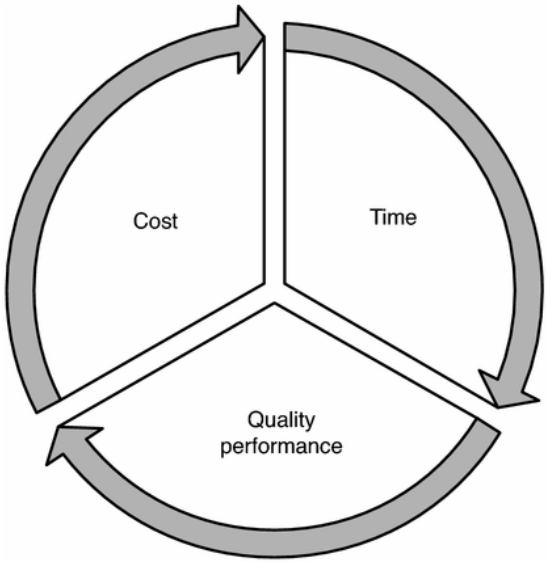


Figure 2.2: Illustrates the general contractors set up their project management teams.

Duties of a Contractor Team Member

The duties of a construction team member differ from firm to company and from project to project. The primary firm representative in charge of overseeing construction activities is known as the officer-in-charge (OIC). The person to whom the customer goes in the case of any issues with the project manager is usually the one who signs the building contract. The OIC may also be the chief operations officer (COO), district manager, senior PM, owner or CEO of the construction business, or it may be the vice president for operations. They may all be the same individual in the case of a small contractor, who could also serve as the project manager and superintendent, as we'll see in some of our later cases.

Within the construction firm, the chief financial officer (CFO) often has an equity partner position. The company's whole accounting department, including taxes, accounts payable, accounts receivable, and internal financial statements like the balance sheet and income statement, are under the control of this person. The Internal Revenue Service, the CFO of the client, and the CFOs of the subcontractors are all often in direct contact with the general contractor's CFO. If relevant, the contractor's separate equipment leasing businesses or real estate development divisions may also be managed by the CFO. These ideas are covered in more detail later in the book. Depending on the size of the organisation, the CFO may also hold other positions such as bookkeeper, accountant, finance manager, and others. The project manager, who often also includes the general contractor, project owner, designers, and subcontractors, reports to the officer-in-charge and is in responsible of completing the project in accordance with all contract requirements. He or she sets up and oversees the project team for the contractor. The roles of the PM for the GC and the worksite cost accountant will be highlighted in this book. The PM's specific duties include the following:

Whether work is done by the contractor's own artisans or those hired by subcontractors, the superintendent is in charge of the direct daily supervision of construction field activities on the project. For bigger projects, final planners—those in charge of doing the actual work, including assistant superintendents and foremen—are given this task to do. The daily activities of all craftspeople working on the project site must be planned, scheduled, and coordinated by the general contractor superintendent. The superintendent must also decide on the means and methods (building techniques) and work strategies for construction operations carried out by the contractor's own work force. The superintendent must also ensure that all

work is completed in accordance with the terms of the contract and that all construction activities are carried out safely.

The project manager is often the person who receives reporting from project engineers or field engineers (PEs or FEs), who are in charge of organising daily details pertaining to field construction and paperwork. The PM may take up the duties of the PE on smaller projects. There may be more than one PE on major projects. Processing submittals and information requests, keeping track of related tracking logs, creating and maintaining contract agreements and communications, evaluating subcontractor invoices and payment requests are all duties that fall within the purview of the PE. The jobsite cost accountant or cost engineer will have comparable duties and qualifications to the project engineer and may even go by the title of project engineer if the project is large enough, distant enough, or of a contract nature to merit one. For the hotel case study and exercises used throughout this book, the cost accountant is situated on the construction site. The project manager and the worksite cost accountant will collaborate closely to record costs, create monthly pay requests, and anticipate future expenses. Together with other financial duties, the worksite cost accountant will collaborate closely with the superintendent and assist in creating cost control work packages.

The project's daily direct supervision of craftsmen is the responsibility of foremen, who are the final planners and who answer directly to the superintendent. For work that is carried out by the business's own construction artisans, the construction company will appoint foremen. Each subcontractor shall choose a foreman for all subcontracted work. Coordinating the organisation and performance of each trade work on the project site, ensuring that the necessary tools, equipment, and supplies are on hand before work begins, and creating daily or weekly time sheets for their crews are just a few of their specific tasks.

Risk assessment

Many factors make the construction industry dangerous, as seen by the high annual failure rate of construction firms. A contractor should evaluate each proposed project to ascertain the risks involved and whether or not the potential benefits justify acceptance of the risk exposure in order to reduce the likelihood of financial difficulty. Each financial research must include risk management, which includes procedures for risk identification, assessment, and reduction. The sources of external risk on a project may include things like unusually bad weather, material cost inflation, the owner's inability to finance the project, a lack of skilled craftspeople or subcontractors, subcontractors' bankruptcies, incomplete design documents, the project's location, theft and vandalism, safety, and the complexity of the project. Forecasting these risks' probability, the range of potential outcomes, and the effects of each on the contractor's capacity to finish the project profitably is necessary. In exchange for the risk taken, projects with higher risk demand more fees than those with lower risk.

Furthermore identified will be internal hazards, which need to be addressed at both the corporate and project levels. Unrealistic cost forecasts, unrealistic construction times, and poor project management are the three most typical internal hazards. Cost and schedule control, material management, and subcontractor coordination are some project management weaknesses. Internal theft is a small risk and is manageable in the ways that are discussed throughout this book. Contractors must take measures to reduce the likelihood that these issues may arise. The choice of capable individuals to oversee the project, particularly the project manager and superintendent, is often the fundamental problem that has to be addressed. The outcome of a risk analysis process leads to decisions on whether or not to undertake a project, how much of a fee and contingency to include in the bid or cost proposal, whether or not to partner with another company, which tasks to outsource, and what kind and how much insurance to buy. In this book, solutions to these problems are also covered. The

relationships between the three main project participants are the main variations between the four main project delivery techniques. One of two processes—bidding or negotiation—is used by owners to choose contractors. Private owners are free to use whichever procurement mechanism they are comfort with, but public owners are often forced to put projects out to open bids. In both situations, contractors may go through a prequalification procedure that reduces the number of companies that are submitting bids or proposals. Also, project owners decide how the general contractor will estimate the cost of the project. Lump sum, unit costs for heavy-civil projects, and cost plus fee projects are the three main pricing strategies. Many cost-plus projects also have a guaranteed maximum price that, while offering financial protection to the project owner on the high side, also offers chances for cost savings if the contractor comes in under budget.

The rules and circumstances of the connection between the owner and the contractor are laid forth in the construction contract. If a project manager hopes to effectively finish the project, having a solid awareness of all contractual requirements is crucial. Contracts may be pre-made or custom-written legal agreements. Since they have been examined both within and outside of the legal system, standard contracts are often recommended. The team in charge of overseeing construction on the worksite is led by the contractor's project manager. He or she is in charge of organizing all the tasks necessary to finish the work on schedule, within the allotted spending limit, and in accordance with the quality standards established in the contract. The planning, start-up, control, close-out, and post-project analysis phases are the five main stages of a construction project. To oversee construction operations, contractors use project management organizations. Depending on the size and complexity of the project, the project team generally comprises of a PM, superintendent, project engineer, foremen for self-performed labour, and administrative support staff. Bigger or distant projects may additionally employ a cost accountant or cost engineer on-site, particularly those with open-book accounting requirements.

Project managers must thoroughly evaluate the risks involved with each potential project since construction is a dangerous industry. Risk management plans must be created when hazards have been identified. Some projects shouldn't be undertaken because the dangers are too high. In other situations, the risk may be reduced by finding a joint venture partner, engaging subcontractors, or raising prices.

CHAPTER 3
RISK ANALYSIS

[1]Dr. Chaya Bagrecha, [2]Supriya Rai
[1]Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]AssociateProfessor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.chayabagrecha@cms.ac.in, [2]supriya@cms.ac.in

One of the most important project characteristics that the project management (PM), superintendent, and cost engineering team must control is cost. To create a construction budget that the project team must work within, project expenses are calculated. The act of gathering, evaluating, and summarising data in order to provide an accurate prediction of the expected cost of a project is known as cost estimation. While creating bids for lump sum or unit-price contracts and negotiating the guaranteed maximum price (GMP) on cost-plus contracts, all project expenses are estimated. The first stage is to create a project budget, which will serve as the foundation for the cost management system that will be covered. This chapter's objective is not to repeat all of the information found in textbooks that specialise in estimating, but rather to draw attention to some of the key problems with creating cost estimates. A baseline estimate must be developed before a study of construction cost accounting procedures can start so that the project team has something to "account" to.

The project manager and his or her project engineers, as well as the estimating department of the construction company, may both create project cost estimates. The PM, cost engineer, and superintendent should, wherever feasible, be in charge of creating the estimate or, at the very least, participate actively in its creation. Their unique perspectives on constructability and their individual commitments to the final estimate are crucial for ensuring both the success of the estimate and the project as a whole. Creating a responsibility list and scheduling the estimate are two of the estimating team's first tasks. Each project's estimating process should be planned, starting with the dates of the pre-bid or pre-proposal meeting and ending with the deadline for the bid or proposal. After these benchmarks have been established, a brief bar-chart plan showing each phase and assigning due dates to the estimating activities shown in the Types of cost estimates in Figure 3.1:

Many people outside of the construction business think that all contractor estimates are the same since they are all "firm bids" and include all the necessary information. This is undoubtedly a myth that is heavily reliant on document completion. Cost estimates come in many different varieties. Detailed cost estimates are created utilizing full drawings and specifications, while conceptual cost estimates are created using partial project documents. For contracts with fixed maximum prices, semi-detailed cost estimates are utilised. As will be covered in more depth below, these estimates include components of both conceptual and detailed estimates. Each of the three major categories of estimations has a different amount of information and a distinct estimation technique or approach. The correctness of the

documents immediately affects the accuracy of the estimate, and the same principles apply to the time required to prepare an estimate. Every estimate has key components or cost categories, some of which need for the estimator to work more meticulously than others.

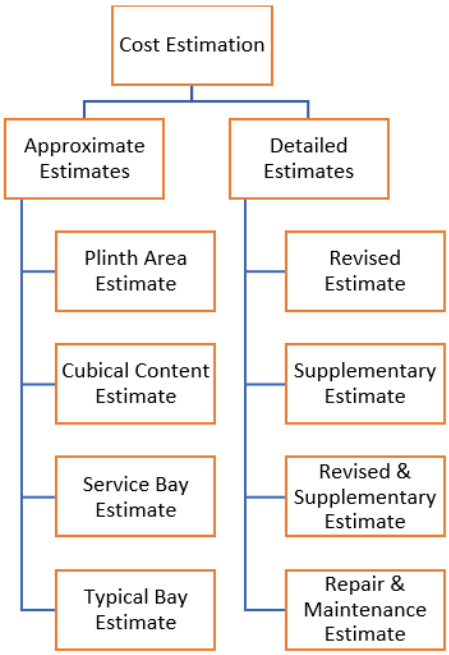


Figure 3.1: illustrates theTypes of cost estimates.

On the basis of incomplete information, contractors or architects may provide preliminary estimates fast. These projections are neither intended to be "firm" nor to be correct. Budgets, schematic estimates, or conceptual estimates are the correct terms to use. A rough order of magnitude (ROM) budget for a conceptual set of drawings may be swiftly created utilising the square foot (SF) of floor unit costs, assembly prices, subcontractor plugs or budgets, and percentage add-ons for general circumstances. A contractor- or estimating consultant-generated budget estimate is often produced after the schematic design (SD) phase is finished, although this is not a firm bid. The majority of goods on a budget are, by definition, luxuries or plugs. Budgets, which are the least reliable estimate type, should include significant contingencies of between 10% and 20%. Only seasoned estimators can create budgets, but a junior estimator or cost engineer may help with quantity take-offs (QTOs) that are related to comprehensive lump sum bid estimates. Even with a thorough set of plans, a contractor will create an early and rapid budget as soon as they enter the building. It is used to establish if the project is the Sui size for the contractor to pursue and which member of its estimating or management team would be most suited to work on the following detailed estimate. This estimate is known as a ROM estimate. A pro forma, which is the subject of the last in this book, is another early estimate created by the project owner, who is often a real estate developer.

The most precise final is obtained from a thorough estimate, which takes the longest to create and costs the contractor the most in staff resources. Normally, thorough estimates go along with drawings and specifications that are 90–95% finished. This would be in line with the conclusion of the design process for the construction document (CD) in Figure 2.2. For projects that are lump sum bid, such a public waste water treatment facility, detailed estimates are necessary. While customers on privately funded projects may request lump sum bids during a poor economy, lump sum bids are often connected with public works projects.

Nonetheless, in a competitive market, project owners could only be able to attract contractors via negotiated requests for quotations. Customers that want lump sum bids are mainly concerned with the final cost and believe all contractors will be able to complete the job with a same degree of quality, on time, and safely. Quantity take-offs, price recaps, early subcontractor plug estimates, worksite general conditions, competitive subcontractor and supplier quotes, and markup decisions are all part of the detailed estimate process.

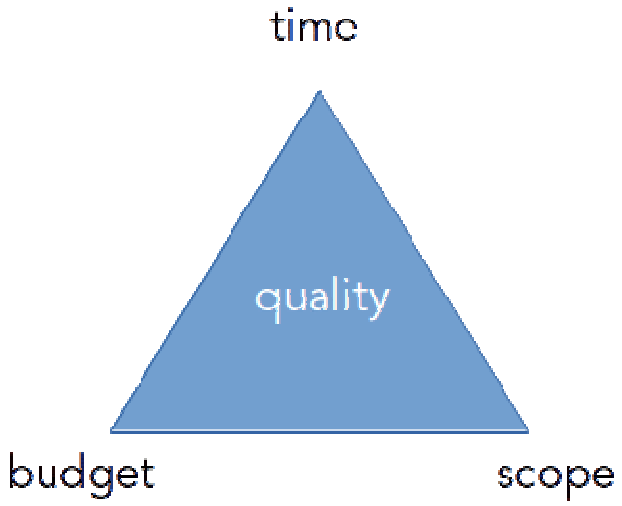


Figure 3.2: illustrates the design process for the construction document.

Budgets and detailed estimates combine to form guaranteed maximum price estimates and the resulting guaranteed maximum price (GMP) contracts. In negotiated projects, GMPs are often created after the conclusion of the design development (DD) phase. For scopes that have been properly planned and specified, such as structural concrete and steel, detailed estimates are prepared using measured quantities and unit costs. For areas that haven't been developed yet, subcontractor plugs or allowances are included, but if feasible, competitive subcontractor bids are taken into account. The contractor will apply assembly charges, such as $/SF or allowances, for work that is not completely planned. In GMP estimates, contingencies are more common than detailed projections and may total 2–5%. Projects with a GMP are often completed open-book, and any resulting savings are split, for example, 80% to the customer and 20% to the general contractor (GC), between the client and GC. It is necessary to define what expenses are eligible for reimbursement and which ones are not. Reimbursable expenditures that are associated with the worksite should be distinguished from general conditions that are associated with the home office and are thus included in the price. These distinctions are important and should be included in the contract before work begins. For the example case study used throughout this book, Evergreen Construction Company negotiated a GMP estimate and signed an AIA A102 contract with Northwest Resorts. The remainder of this covers the steps involved in creating a thorough estimate, including the work breakdown structure, quantity take-offs, pricing direct and subcontracted work, general worksite conditions, and ending with the estimate summary and related markups.

Work breakdown structure

The procedure is built on the initial phase of information collecting. Up until there is only one price left, the final estimate or bid, information is continually evaluated, summarised, and refined as the estimator moves through the process. The project's work breakdown structure (WBS) is a preliminary list of the key tasks for which there will be related cost or scheduling considerations. This applies to projects including concrete walls, outdoor pavement, ceramic

tile, electrical work, etc. The estimator should produce this broad overview of all the work that will be included on the WBS before creating specific take-offs and pricing. An overview of the document is performed as one of the first phases in the estimation process. The estimator should carefully review the plans and specifications to have a thorough grasp of the project's scope and its associated building systems. Until this review is finished, the estimator shouldn't begin characterising or pricing any job items. an example of a condensed WBS for the case study project. As a response to an exercise, an enhanced WBS is provided on the eResource. This list is a useful resource to use as a guide throughout the estimation process and as a last checklist to review before submitting the estimate. This preliminary WBS should only be seen as a first step and not as a finished result. This study of accounting and financial management has a recurring subject of cost codes, and the WBS is a sui area for the estimator to begin utilising them, even if simply with two-digit Construction Specifications Institute (CSI) divisions or six-digit specification sections. Throughout the estimating, scheduling, and subcontract buyout procedures, the WBS will keep changing. There will be numerous more in-depth levels of the WBS as the estimator delves further into the project.

Self-performed construction projects will need a more intensive quantity take-off and pricing effort. It is appropriate for the estimator to distinguish between direct and subcontracted scopes of work at this early stage of the work breakdown structure. Commercial general contractors may use their own direct teams to do a variety of tasks, such as the installation of structural steel, rough and finish carpentry, doors, specialty, and accessories. The carpenters, labourers, and ironworkers of the general contractor often install these scopes of work directly. Many factors are taken into consideration while deciding which job scopes to self-perform and which to outsource.

If the expert trades people required are not employed by the GC, subcontractors will be utilised. U Since they specialise in a particular line of work, like windows, subcontractors are sometimes referred to as specialty contractors because they are supposed to know that line of work better than other contractors. A subcontractor must do the necessary repairs without increasing the cost to the general contractor (GC) if there are issues with the installation's quality. Since the subcontractor may have projected a fixed price that is lower than the general contractor's estimate, the subcontractor would be taking on the risk of pricing. The general contractor may not have the skilled labour and tools that subcontractors have.

Both the subcontractor and the general contractor can complete the task, but one can do it more quickly, safely, affordably, and to a higher standard. In the case of the Olympic Hotel project, Evergreen's regular office is three hours away from the construction. Transporting and housing their direct staff throughout the week would be challenging and costly. As a result, Evergreen may outsource more work on this project than they would if it were in the vicinity of their office, namely the greater Seattle region.

A project item list, which is effectively a work breakdown structure with columns separating direct labour and material from those of subcontractors, is another tool the construction team could use at this point. On the eResource, there is a live Excel version of the project item list. Subcontractors should be informed about the project when the estimator, project manager, and superintendent have determined which scopes of work to subcontract. With an electronic invitation to bid and an access code to the design files, this is probably done today. In addition to the general contractor creating its own estimates for self-performed work, it is a good practise to have the subcontractors participate with the estimate simultaneously. When informed, subcontractors will query the estimator on the requirements, quantities, and supplies. Specific subcontractor scopes should be disclosed to the cost engineer or estimator at that time, but care should be taken to avoid giving the subcontractor too much information.

General contractors don't want to find themselves in a situation where subcontractors are only basing their rates on data provided to them by the GC estimators. Each subcontractor should create an estimate that is wholly independent. The work breakdown structure may serve as a preliminary "bill-of-materials" from which the superintendent and cost engineer can issue short-form purchase orders and place material orders provided it is correctly created and has enough information and cost codes.

Count take-off

After the creation of the work breakdown structure, the estimator immediately gets material amounts from the drawings. The estimator does thorough measurements and counts of each task that the team choose to self-perform in order to prepare quantity take-offs. The work items that will be built first are the foundations, which is where the quantity take-off procedure begins. This is usual for projects that are commercial, civil, or residential. Many objectives will be met by this arrangement. The estimator will be forced to think like a builder since the foundations are constructed before the floor systems. This is another reason why it's critical to include the superintendent early in the estimate production process. This estimate's organisation will help with the creation of the project's cost control systems and the development of the schedule in the future. It is recommended that all work items be removed before pricing, although some estimators execute QTO and price concurrently, which is another benefit provided by computer estimating technologies. Similar to the Olympic Hotel QTO sheet, material quantities are noted on these pages.

Material quantities that have been measured and counted must be mathematically transformed into units that can be purchased and correspond to market unit prices. For instance, the cubic feet of concrete must be divided by 27 to get cubic yards. Concrete is measured in terms of length times breadth times height or thickness or depth, which results in cubic feet. Similar to how plywood floor and wall sheeting is purchased in individual sheets, structural steel is also bought by the tonne, wood framing by the thousand board feet. According on the material, installer, project, and estimate, different amounts of waste or lap should be used. Allowing 5% to 10% is typical and is taken into account when calculating quantity. To sustain worker efficiency, it's crucial to buy just enough material. Nails, adhesive, caulking, and rebar tie-wire are examples of items that may be approximated or allowed for, but identifying precise amounts is challenging and falls outside of Pareto's 80-20 rule, which states that 80% of costs are accounted for by 20% of activities. The estimator spends more time and money on these minute details than the materials are worth. At this point, allowances are often sufficient. Quantity take-off sheets for work that has been subcontracted are created in a similar manner, although they are not required to be as thorough as those for the general contractor's direct work. For instance, the general contractor (GC) will take off sheetrock walls, together with metal studs and tape, by the square foot or linear foot of wall system, rather than separately quantifying sheets of drywall, metal studs, and taping mud. For subcontracted work that will be replaced later when competitive quotations from the subcontractors are supplied, order-of-magnitude (OM) estimates will be created.

No project has a single precise estimate, however some estimates are more accurate than others. Individual contractor judgements about price adjustments, subcontractor and direct labour tactics, worksite overhead structures, and fee calculations will produce the most accurate estimate for those circumstances at that time. Recapitulation sheets with pricing information are created for each system or CSI division that is used. After all of the items have been removed and their quantities have been noted on the quantity sheets, the estimator should begin pricing. The estimator should start pricing labour and direct materials after all

quantity take-off has been accomplished. All of the recapped material amounts are brought forward from the QTOs, circled or otherwise marked, and placed into the price recap sheets. An illustration of a price summary sheet.

Costing one's own work

It is improper to refer to all of the men and women who use their hands and equipment to do tasks on construction sites as "construction workers." Instead, they are known as tradesmen or craftsmen and have a particular trade or specialty, such as a plumber and a carpenter. They have received training and have chosen to focus on a single skill, such as installing conduit and wire, for example. However, not all of them should be referred to as "construction workers" since that title refers to a skilled profession that includes tasks like placing concrete in addition to others. Since "workers" is too broad, this book will continue to use male gender designations for tradesmen, craftsmen, journeymen, and foremen. There isn't currently a widely recognised gender-neutral word for these occupations. But "trades" or "crafts" may be used to refer to artisans and trades people. The most hazardous component of the projection is direct labour productivity since it is the hardest to estimate. There are no regulations, and contractors may only manage, not regulate, real field productivity, which will be covered. Contractors can only guesstimate the number of hours it will take to complete a work. A general contractor will often go at the amount of direct labour in an estimate and use this quantity as some kind of basis for figuring out the entire project risk and, therefore, the proper price to apply. Man-hours (MH) are a measure of labour productivity and one MH equals one door. This is known as UMH, or unit man-hours. Using this approach, labour rates, union vs. open shop preferences, geographical variances, and temporal changes are all possible. If foundation reinforcing steel installation in Atlanta requires 8 MHs per tonne, Aberdeen presumably follows suit. You may use the proper pay rates for the particular assignment. The estimator's internal database is the finest source for information on labour productivity. A database should be created for each estimator or contractor using past estimates and as-built labour data. Moreover, available databases and reference materials like RS Means' Building Construction Cost Data may be used to calculate worker productivity rates.

On the price summary sheets, computed man-hours must be rounded to the next whole number. Extended fractional MHs shouldn't be kept. Partial MHs are challenging to plan and keep track of for cost management, much alone explain to the superintendent why 2.8 MHs instead of three hours are needed to install kitchen appliances in hotel units. Estimation is a blend of arithmetic and excellent judgement; it is not a precise science. At the bottom of each price page, the MHs are tallied. In the future, scheduling and cost management will benefit greatly by knowing the entire system hours. The employer, location, any relevant union agreements, and the nature of the job to be done all influence the pay rates that are used. The Department of Labor's Davis-Bacon or prevailing wage rates, which set pay rate values for public construction projects, follows with a sample pay schedule for Evergreen Construction. The price recapitulation sheets for non-prevailing wage projects only provide bare wage rates (payed to the employee). The estimate summary page also includes labour costs or labour taxes. Depending on the trade, this line item may increase the labour estimate by between 30 and 60% and will pay for things like workers' compensation, union benefits, unemployment, FICA (social security), and health insurance. These proportions change across time and space. Before calculating a labour burden markup %, the estimator should consult the chief financial officer of his or her firm and the most recent accounting information. Goes into great length about the work burden, which includes labour taxes and labour benefits.

Some estimators use crew pay rates, which include apprentices, foremen, and journeymen.

This is a regular practise that often averages out to the journeyman's compensation. Some will use blended pay rates that take into account labourers, carpenters, cement masons, and ironworkers all at once. Others will employ loaded wage rates, which incorporate the craftsman's bare pay with the labour cost. To support better cost control efforts and more precise as-built estimate development, an estimator and cost engineer will maintain various crafts and direct pay distinct from burden. This thorough method makes open-book accounting audits simpler as well. Instead of databases, suppliers are the best places to find costs for material units. Pricing for materials is comparable to how construction equipment rental costs are obtained. Early on in the process, suppliers are asked to submit quotes at the same time subcontractors do. The general contractor should get an up-to-date price for any equipment or material that will be acquired. Written price quotes on the supplier's letterhead must be accepted. The resource has a working example of a telephone bid proposal form. Although pricing on the vendor's letterhead is always preferred, company-consistent forms should be used if telephone quotations are received. It is common to receive material quotes electronically. Other sources of material prices include in-house historical costs or previous estimates. Historical prices are not as reliable as current quotes, but it is better than leaving an item blank. The third choice for material prices are databases or reference guides. These sources suffice for unusual items for which local quotes cannot be obtained or as allowances or subcontractor plugs or order-of-magnitude estimates in early budget development until competitive prices are received.

Pricing subcontracted work

The best source of subcontractor pricing is from subcontractors. They are the ones who will ultimately be required to sign a contract and guarantee performance of an established scope of work for a fixed amount of compensation. Subcontractors are invited to bid on a project as one of the early steps in the estimating process. Just as general contractors market to project owners, they should also treat past, current, and future subcontractors with respect so that they receive complete and competitive future bids. Some subcontractors may also provide GCs with early budgets for their scopes as place-holders until bid day quotes are refined. Additional ways to treat subcontractors fairly are to assure timely monthly payments and release of final retention after close-out as will be discussed in respectively.

General contractors should estimate subcontracted scopes in-house to refine day-one rough-order-of-magnitude budgets and to check the reasonableness of subcontractor bids once received. These in-house GC estimates for subcontracted work are referred to as order-of-magnitude esti- mates or plug estimates. If one low bid of $432,500 for roofing comes in and another higher bid of $900,000 is received, the GC can feel comfor throwing the high bid out because their pre- bid plug estimate was $450,000. The reverse may be true on another system, if the GC’s estimate was nearer the high bid. Once a reliable subcontractor price is received, the GC’s plug estimate should be replaced with the subcontractor’s price. The estimator should not assume that the firms which specialise in a particular scope, such as landscaping, are all in error and that his or her early in-house plug figure is the most correct one to be used on bid day. A bid tab spreadsheet is customarily developed to aid in the analysis of comparing subcontractor and supplier bid day pricing.

Typical working conditions

The phrase "general conditions" has a wide range of applications, which will be covered in more detail in the next chapters. Costs associated with common jobsite conditions are project-specific, not generic or universal. While one of the most challenging and dangerous duties for the construction estimation team is predicting direct labour expenses, assessing worksite general conditions is similarly challenging and dangerous. Jobsite administration expenses

are another name for site-specific general conditions costs. The contractor must have some concept of the projected project's construction length beyond that specified by the project owner or architect in the request for quote since so many line items in the worksite general conditions estimate template rely on time. Even if they are not needed, schedules must be kept internally to support the creation of the estimate for the general circumstances of the worksite. Schedules are sometimes required to be presented with bids or cost proposals. It is a pretty easy procedure to produce a 20–40 activity summary plan using previous experience, in addition to the projected direct work man-hours and the superintendent's input. Based on these hours, the intricacy of the project, and early subcontractor feedback on durations and deliveries, the project team will draw out a timeline. For the worksite general conditions estimate, this time is utilized to establish overall durations for estimating site administration and equipment rental. It is not required to calculate the precise number of working days the project team will need to finish the construction. But, it's crucial to understand that because to the site circumstances, project complexity, lengthy lead times for material deliveries, projected weather, and available personnel, this construction would likely take around 16 months to complete (rather than 12 or 24). Includesbrief general conditions estimate and a summary schedule for the Olympic Hotel and Resort case study project. The resource also has a complete construction schedule and a thorough general conditions estimate for the case study project.

The building cost estimate has to include a lot more components. All direct work estimates, subcontractor pricing, general conditions, and markups will be included on an estimate summary page. The whole company should create and utilise an estimate summary form that is identical to other estimating forms. For every given project, it could need a little tweaking, but its consistency is crucial to provide the project estimating team a rapid and comfor overview before and on bid day. Consistency is key inside any construction company with regards to all estimating, construction management, and cost accounting forms. Consistency lowers mistake rates, which boosts output and revenue. The estimate summary for a bid work should be completed to the best of your ability the day before bid day. The first preliminary estimate that was created the day the bid or proposal materials arrived at the contractor's office should be refined into a pre-bid day estimate summary. The estimator should utilise the most recent and pertinent price information as they work to create the estimate. Posting the data on the summary sheet advances all of the price recap pages. As there are several obvious flaws that might happen in the math, the estimator should have someone else examine it. During this phase of the estimating process, the computer is a great and common instrument to employ. In this digital age, printing physical copies may seem antiquated, but often this is the only place where glaring mistakes may literally "leap off the page" at the estimator and/or his or her supervisors.

A series of percentage markups, including the fee, are included below the subtotal of the direct, indirect, and subcontracted expenses at the bottom of the estimate summary. Home office overhead and profit, or "OH&P," makes up the charge. Costs associated with running a home office include pay for officers, marketing, and bookkeeping. These expenses are often a fairly fixed amount depending on staffing for one fiscal year. To offset these expenses, a general contractor of ordinary size may need to earn a mini- mom charge of 1% to 4% (i.e., 1% to 4% of their total yearly volume). The contractor hopes to make a profit on each project in addition to paying the indirect charges. The charge is equal to the anticipated profit plus the indirect cost of home office overhead. Due to the increased direct labour risk, fees for commercial work may vary from 2.5% to 7.5%, and often go up to 10% or more for civil and residential projects. Due to lower yearly volumes, smaller commercial contractors often demand greater costs on their projects. The danger is proportionally raised and the cost is

increased if the general contractor does a large amount of the job themselves. Conceptual cost estimates may be utilised in cost-plus contracts to determine the guaranteed maximum price, but it is still necessary to estimate home office overhead expenses in order to create a fee proposal. Every estimate summary page will include several % add-on markups. The right markups and percentages also depend on the kind of contractor (subcon- tractor, supplier, commercial GC, civil, residential). Some of the most typical ones are as follows: The cost of labour, particularly direct labour, is not actually a markup but rather an expense of the job. Although some contractors factor the burden below the line with the remaining markups, others that employ loaded wages will factor it above the subtotal line with the work. Volume affects general liability insurance. Depending on the size and safety records of each contractor, the insurance cost will vary widely. This markup typically falls between 1% and 2% for smaller general contractors and subcontractors and less than 1% for big commercial and civil contractors.

Taxes such as the material sales tax, the company tax, or the excise tax should be job-costed but depend on the city, county, and state. The amount of contingency used in a competitively bid project with reasonably full paperwork is often zero. For projects with a competitive fee structure, the majority of GCs factor in any contingency. Negotiated projects with incomplete documentation will have stated contingencies. While the prices of project bonds are project-specific, performance and payment bond rates are also based on yearly volume and business performance. They often do not show up on projects that are under negotiation. These may be necessary for bigger lump sum projects, particularly for public and civil construction, and the cost will vary depending on the scope of the project and the contractor's prior performance. In a lump sum bid, the bond cost is often "below-the-line," that is, below the basic bid, or it is an alternative add-on and is not included in the quotation.

The emphasis going forward will be on home office overhead and profit, which matches the charge. There will also be discussion of a few of these additional markups. On the day of the bid, the final bid or proposed price is decided. This completes the estimation process. The process of receiving subcontractor bids, removing plugs, and revising and replacing the pre-bid-day budget totals with hard bid prices. In most cases, the officer in charge of the construction company approves the final proposal. Prior to the designated bid time, the complete amount must be provided to the customer on the form mentioned in the instructions for bidders. An overview for the case study on the Olympic Hotel. In the eResource, there is a ten-page estimate that is comprehensive. will finally provide accurate and realistic estimations. The third lesson is the need of maintaining and using past databases of productivity and cost data from earlier initiatives.

Typical working conditions

The construction project manager (PM) must be explicit about the application of each phrase they use since they do not all have precisely the same meaning to all of the stakeholders in the built environment. This is devoted to general worksite conditions. The following will concentrate on home office expenses and revenue (OH&P). To distinguish these extremely essential parts of construction management and their relationship to estimating, accounting, and financial management, it is often easier to use the prefix worksite or home office.

Creating concrete footings, installing structural steel, hanging and pasting gypsum wall board, attaching light fixtures, and hundreds or even thousands of additional tasks are only a few of the real field construction operations that go into calculating direct expenses. The effects of these efforts, whether they include labour or materials, become apparent during construction and/or after the project is finished. However the project does not directly see or measure the effects of home office or worksite general circumstances. As a result, these

efforts are scattered over the whole of the activity and are therefore appropriately referred to as indirect expenses. The procedure for estimating each of the several worksite general circumstances aspects as well as the creation of a comprehensive estimate will all be covered in this chapter. The contractor uses a number of techniques to create and maintain that estimate. These expenses will be managed by the project manager and supervisor of the contractor. At the worksite, general contractors (GCs) are very time-dependent; if the project takes longer, it will cost more. Alteration orders and delays have an effect on those expenses, but the effects are not always reimbursable and may be difficult to evaluate.

Basic worksite conditions and their components

The extent of the overall worksite circumstances might be determined in a variety of methods for an estimate. It may be as easy as adapting a prior estimate slightly suit the new project. While this job is referred to as general, each project is unique, and the GC's estimate should reflect this. Advanced contractors employ extensive templates to select and choose components that pertain to a particular job. The estimator will search the client's contract and the front end of the specifications (CSI divisions 00 and 01) for management needs that must be included into this project as one of the first things they accomplish. Various contract types might have a big influence on estimating and accounting. Laydown, security, and a hoisting strategy are examples of worksite circumstances that have an effect on general contractors (GCs). The estimator may then start creating a personalised cost estimate by selecting prospective estimate components from a long template. The GCs template normally has four main categories. Again depending on the task, the estimate may ultimately be condensed into a single page or two, and these four sections may be bundled together. The four categories and a few representative things that may be found in each are shown below. The eResource contains a comprehensive, four-page blank Excel GCs template.

Some of these components could be included into the estimate's direct work part, as explained in the Techniques section below. Some of the things may not be included in this particular project or might be supplied by someone else, such the project owner. It's crucial to avoid removing any of the components from the template since otherwise, it would be impossible to tell if they were missed or removed on purpose. Items that are specifically omitted must remain on the template and be properly marked. A construction loan and the associated interest rates would seldom ever be included in the contractor's estimate. Our template does not have a line item for loan interest, but one might be included if the estimator decided it was necessary.

CHAPTER 4
ELEMENTS OF JOBSITE GENERAL CONDITIONS

[1]Dr. Batani Raghavendra Rao, [2]Yashoda L
[1]Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]br.rao@cms.ac.in, [2]yashoda@cms.ac.in

The project manager and chief estimator may start adding quantities, units, and pricing to the general conditions estimate template once they've adjusted it for their particular project. The GC's estimate doesn't get started until the majority of the other detailed estimating work has been finished. A construction time must be created since many of the elements in the GC's estimate rely on time. It will be created as follows: Add up all the hours spent on direct building labour, The superintendent will analyse the hours and calculate durations using an expected team number. The feedback of subcontractors on timelines is particularly beneficial, Even if it is not specified in the client's request for quote (RFQ) or request for proposal (RFP), a construction schedule should be created. If specified in the contract agreements, the entire length of the contractor and customer should be contrasted.

A completely comprehensive construction schedule need not be created at this phase unless the contractor is the only one submitting a negotiated bid and is certain that they will win. A thorough schedule that has at least 100 line items and perhaps 1,000 will be required after award in a competitive bid or negotiated situation. To create the general conditions estimate, a brief schedule which is often asked with competitive bids and proposals will be sufficient. Serves as a brief time for the hotel case study. In the eResource, there is a time that is completely described.

Many of the general conditions cost items may now be estimated as the estimator is aware that this project would last 16 months. For instance, in our case study, the superintendent would work full time on the project and get a $10,000 monthly pay. Furthermore employed full-time will be the project manager, the project engineer (PE), and the administrative assistant. The on-site accountant will divide her time between cost engineering work and routine PE tasks. The cost includes several more line items in addition to the superintendent's pickup vehicle, forklift, and two worksite trailers.

The price of certain work-related components or the estimated cost of the complete project may have an impact on other items in the general conditions estimate. One instance is tiny tools, which are estimated to be 5% of the direct labour cost but are not given by the craftspeople. There is just another justification for why it was essential to determine the direct cost of the job before to developing the GCs cost. Additional costs are determined as a proportion of the overall cost of the work, if they apply to this particular project and are not shown on the estimate summary. As opposed to direct labour, estimators seldom prepare quantity take-offs for GCs.

For general situations, pricing shouldn't be obtained from publicly available estimate databases like RS Means. As was previously said, GCs must be job-specific as well as company-specific. One company could pay its accountant $1,200 per week, while another would pay them $1,500. In exchange for higher remuneration that is paid out as part of their wages, some companies may provide their superintendents pickup vehicles to drive home in

at the conclusion of the workday, while other companies may require super- intendents to provide their own trucks. Using the procedures outlined above, an experienced estimator will create a rapid general conditions estimate, print it out, and let it sit for about an hour. Next they mark it up with a red marker, enter the edits, and repeat the editing procedure many more times. To receive the superintendent's approval, draughts of the estimate should be discussed with him or her. Some contractors delegate the task of creating the project-specific GCs estimate to their home office chief estimator, but the PM and superintendent need to be heavily involved, if not create it themselves. They should at the very least evaluate, approve, and comment on the scope, duration, and cost.

The final sum of the general conditions is not known with certainty, but generally speaking, they range from 5% on bigger projects to 10% on smaller ones. On the upper end are residential developments and large-scale civil projects. The quantity of direct work a contractor does, which necessitates more intensive administration and oversight, also has an impact on the final cost. GCs will be charged more for negotiated open-book projects than for closed-book bid contracts. The total % should be mentioned at the bottom of the GC's estimate page as well as next to the GC's line item on the overall estimate summary page. For the Olympic Hotel and Resort case study project, the general contractor's (GC) estimate for Evergreen Construction Company (ECC) came to 6.8% of the overall contract value. With the project's $24.5 million price tag, this may seem a little excessive, but given its out-of-town location, it is still a fairly reasonable sum. Several estimators also calculate the cost of general conditions as an average monthly cash amount. The monthly cost is significantly impacted by different project types, such as whether a tower crane or a personnel hoist are needed. The GCs estimation should also include this monthly average. The estimate should be revisited and either modified or the estimator should grasp the variations due of the special characteristics of this particular project if it is much higher or lower in either percentage or monthly cost compared to other prior projects. Before completing and uploading the GCs total to the estimate summary, the estimator should independently examine his or her own work.

The past introduction of the labour burden (labour taxes + labour benefits) will be handled once again with taxes and audits. On whether burden should be added to the cost of direct pay and included above the subtotal line with the labour, or below the line as a percentage markup, there are many schools of thought. In the case of a general conditions estimate, direct labour, such as a safety officer and worksite accountant, has been mixed with craft labour for scopes like cleaning or machine operation. These must be calculated individually since salaried work gets a significantly lower burden markup than craft labour, say 30% as opposed to 50%. Craft work differs as well based on union preferences. A knowledgeable customer could also request labour burden markups and predetermined pay rates on the proposal or bid form. Some estimators will include the labour cost for GCs below the line on the estimate summary page, while others will do so on the GCs estimate page. It is essential that markup rates for craft and salaried labour load be calculated individually, regardless of location, and that the burden be included in one area in the estimate and not ignored or calculated twice. This discussion has been founded on the assumption that the contractor would provide a thorough general conditions estimate rather than just allowing an 8% increase in the cost of the direct work, including subcontractors. Only with schematic budget estimates, not with comprehensive lump sum or guaranteed maximum price estimates created by knowledgeable contractors, would an estimator use this method. Smaller, less experienced contractors could include general contractors (GCs) as a percentage add-on to the overall estimate, but this is unreliable, not recommended, and it cannot be tracked, regulated, or recorded as is mentioned later.

Strategies

The overall circumstances at the project and at the contractor's home office might be estimated and managed in a number of different ways. It is incorrect to consider general contractors (GCs) to be overhead, particularly on the worksite. Business analysts will talk about ways to save expenses and increase profits through reducing overhead. This could be the case for general contractors (GCs) working from home, but not always on the project. These operational and administrative costs are required to support field construction. Adding more worksite GCs may reduce direct field expenses and raise fees, which boosts profit. Spending extra money on weekly worksite cleanliness, for instance, may enhance conditions for site access, material handling, labour productivity, and site safety.

When design companies offer prices to customers, they include all of their operating expenses, profit, and the costs of the materials, labour, and equipment used to create the design. Clients and designers consider fees when evaluating a general contractor's worksite estimate, however these costs are not fees. However, contractors typically lose money on their GC estimates, i.e., they spend more on management than they anticipated to support the field efforts, frequently as a result of schedule delays. This misconception is shared by some built environment participants who think contractors have hidden fees buried within their GC estimates. Some owners of construction projects use a hybrid procurement procedure that combines standard RFP features like resumes and business histories with a flat sum price (which includes home office expenses and profit) and worksite GCs. With CM-at-risk or CM/GC delivery techniques, this is often the case. As a result of the attention contractors place on their GCs' estimations, the proportion that GCs add to the cost of direct work becomes competitive. Then, contractors plan how the general contractor's estimates are created and handled and come up with strategies to reduce the estimate and maybe the cost. Here are a few of these tactics:

Secondly, wherever feasible, contractors will shift home office GCs to worksite expenses. Fee equals home office overhead plus profits (Fee = OH&P), and because the company's overall net profit is what they truly care about, any decrease in HOOH and transfer of costs to projects, while maintaining the same fee, increases profit. In order to assist transfer expenditures from the home office to the worksite and have the customer pay for them, a contractor may suggest wording modifications or inserts. The following are some instances of expenses that might be transferred from the topic of home office GCs in the next to the jobsite: U Appointing a senior project manager as the project's PM; charging the project for the repair and upkeep of contractor-owned equipment; locating the PM on-site rather than in a home office; and using a worksite accountant to handle most of the cost engineering typically carried out at a home office. Consider a contractor that charges 5% of the expected $100,000,000 in yearly building volume, 2% of which goes to HOOH, and 3% of which goes to profit. Thus, the business typically spends $2,000,000, or 2% of $100,000,000, on HOOH, and makes $3,000,000 in profit. Thus, $5,000,000,000 is their overall 5% fee. If 25% of those HOOH costs were transferred to the projects, HOOH's cost would drop by $500,000 to $1,500,000 (down from 1.5%), and with the same charge of $5,000,000, their new profit margin would be $3,500,000, or 3.5%. This amounts to a $500,000 profit increase without adding any new work.

Heavy-civil contractors often subcontract less work, whereas residential contractors (particularly spec builders) outsource close to 100% of the work. Commercial general contractors typically subcontract out 80% or more of the work. The hardest part of the estimate for any contractor to manage costs is direct labour. The risk is lower and the costs associated with managing the work on the worksite are lower the more work is subcontracted.

General contractors will want their PMs to delegate as much of their GC's tasks as they can to subcontractors. These cost and responsibility transfers must be both contractually accep by the subcontractors and manageable from a management standpoint in order for this to happen. There are several instances of this happening, such as when roofing contractors and other subcontractors operating on the roof, such as mechanical and electrical subcontractors, provide their own lifting and scaffolding, respectively. Forklifts are provided by subcontractors themselves; The bid package for the heating, ventilation, and air conditioning subcontractor must include temporary heating; the bid package for the electrical subcontractor must include temporary electrical power and lights; and the subcontractors must provide their own dumpsters. Each subcontractor provides one worker per week to clean up the site, regardless of what needs to be cleaned up. Earthwork and utility subcontractors may also offer their own flaggers. Subcontractors often already provide their own tool trucks and office trailers.

Cost coding activities and expenditures to direct work activities in place of GCs are two more ways the PM and superintendent must lower the price of worksite GCs. It is possible to cost-code foremen, general foremen, and assistant superintendents who are in charge of overseeing craft labour operations, such as the construction of concrete forms. Examples of this kind of equipment include charging cranes, welding equipment, compressors for construction, and other things. The contractor will have a thorough understanding of the costs associated with that system of work for developing future estimates if equipment is included with the cost of the work rather than with GCs. Activity-based costing, which is covered later in this book, focuses on the application of GCs to work activities.

If the contractor uses its own internal surveyors to do the surveying, the cost is included in the GCs since it is split over numerous activities. In contrast, if licenced professional surveyors are hired as a subcontractor, this expense may be categorised alongside other subcontract costs.

Final cleaning is another option on the GCs estimating template, but if a subcontractor is contracted to do this job, the estimator may combine those costs with other subcontractors, like painters and glaziers, and exclude the subcontractor cost from the GCs. Some general contractors will not include site security, window cleaning, scaffolding, or flagging services in the general conditions and instead outsource them out. To be transparent with this customer who is knowledgeable about construction, several of these subcontractors were included in ECC's GC's estimate.

Accounting for general worksite circumstances

Particularly from the standpoint of a general contractor, the project manager and project superintendent are the two individuals who are most "accoun" on a construction project. Their responsibilities in developing the worksite general circumstances estimate and the plans for controlling those expenses have previously been outlined.

As will be covered in the following chapter, the CFO and CEO, not the worksite team, are in charge of managing home office GCs. The worksite crew must monitor the GC's spending during construction in the same way as they would their own direct labour, material, and subcontract costs. Although though the project manager and superintendent are in charge of the project's financial performance, they often depend on project engineers, cost engineers, and worksite accountants for cost control and support tasks. was used to introduce the accounting cycle. The worksite team will take the following actions in order to account for the GC's estimates in Figure 4.1:

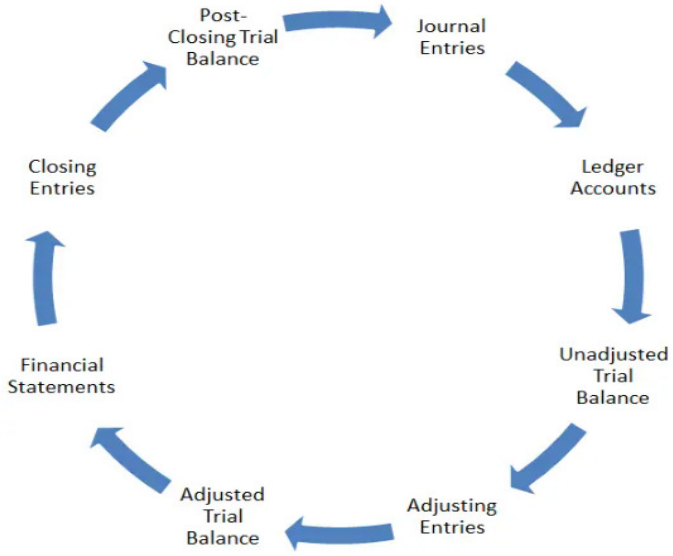


Figure 4.1: Illustrates the accounting cycle.

Before entering the cost control system, the estimate has to be adjusted. If it turns out that the project will take a month longer or shorter to complete, the worksite general contractor may need to adjust the durations of time-dependent activities and employees. A project engineer was anticipated to work full time and earn $1,200 per week, but a more senior PE is now being considered for the project, working three days per week and earning $1,500 per week.

Buyout values and cost codes from subcontracted scopes and let purchase orders must be entered into the accounting system. As was previously said, several worksite GC components are outsourced. Weekly time sheets for craft labour doing indirect tasks, like the forklift operator, and indirect paid labour, like the field administrative assistant, must be completed, and cost codes must be issued. The home office accounting department will log the wages for the majority of salaried workers on the worksite into the job cost history report. Cost coding for indirect material bills is required every week. The worksite accountant or cost engineer must correctly insert the cost codes on the invoices and ensure that they precisely match the cost codes set up in the cost control system. Invoices for equipment rentals must also be expense tagged every month. This applies to everything, including the copy machine and the pickup truck. The cost of equipment ownership and rental maintenance must be closely monitored; this topic will also be covered later in this book. Moreover, rental durations must be maximized: renting a piece of equipment for a full week is less costly than renting it for four days, and renting it for a month is less expensive than renting it for three weeks out of a month. The cost of mobilization and demobilization for equipment that is constantly cycled in and out of service might be high. With the help of his or her cost engineer or worksite accountant and with input from the superintendent, the PM will once per month develop a cost projection for higher management. Forecasting costs and fees will be thoroughly covered. This is once again particularly time-focused when it comes to worksite GCs. There may still be around $450,000 worth of GCs to spend if the project has been spending $90,000 per month on GCs and there are five months still to go, unless a specific item, like a tower crane, is finished and has been demobilised. With GCs, there is less of a chance of underestimating productivity rates or quantities than there is with direct labour and material. Time is the biggest danger in failing to meet the GC's estimate. If the project is supposed to take 16 months but instead takes 20, there will probably be a 25% cost overrun. The schedule control, cost, quality, and safety controls must all be closely monitored by the PM and superintendent.

Effects of claims, delays, and modification orders on overall conditions

As previously said, going over schedule will have the most impact on worksite general conditions expenses. The construction team is solely responsible for the schedule risk for work that is specifically drawn out and specified. Yet, when scope adjustments take place for reasons outside the contractor's control, this might negatively impact the time. Any delay in the amount of time needed to finish the work will immediately result in an increase in these expenses since the development of the GC's estimate is very time-dependent. 15 will discuss accounting for change orders.

The majority of modification orders are a result of little errors and do not individually have a negative impact on the timeline. Unless every scope item was initially shown on the contract schedule, which would result in a schedule with thousands of activities and make it very challenging for the contractor to manage, report, status, and update, it is difficult for a contractor to demonstrate how each individual change order item delays the schedule. This author/expert witness saw a high school construction schedule with 10,000 line items that wrapped around all four walls of the worksite trailer. The schedule was openly bid. The general contractor created that time only to anticipate and demonstrate scheduling effects and to file a claim at the conclusion of the project, which they accomplished. Some contracts have provisions that, if supported by documentation, enable the contractor to recover certain general conditions items on a change-by-change basis. In this situation, it would have been advantageous for the contractor to have created a full construction time and GCs estimate rather than a below-the-line estimate with an 8% add-on. Nevertheless, many contracts now have a "no claim for delay" language that forbids any member of the construction team from recouping the cost of the general contractor (GC) in the event that the project is delayed by the owner or designer, the weather, or other factors beyond their control. The contractor may be granted longer time or days, but there are no additional general conditions expenses or possible fee recovery.

Expenses and Revenue

The overall circumstances of the worksite were thoroughly covered in the previous chapter. The project manager (PM), with support from the superintendant and the worksite cost accountant, is in charge of managing general jobsite conditions. In this chapter, the home office is once again the main topic, along with a basic overview of home offices. Despite the fact that the project team has little to no involvement on home office management concerns, it is crucial for PMs and superintendents to comprehend how HOOH affects the project. The following equations illustrate how HOOH is added to the intended profit in this situation to obtain the charge. As fee is what remains after all construction expenses have been deducted from the contract value or income, fee is a worksite priority. Each building project must provide money in order to cover HOOH costs. Each project is required to pay for its fair share of HOOH.

The chief financial and executive officers (CFO and CEO) are in charge of creating the home office general conditions (GCs) or overhead estimate and managing that estimate. Most project managers are quite unlikely to ever read their corporate GCs estimate, unless they are promoted to an officer position within the organisation. To cover the home office GCs, the construction business must generate enough income from its project locations. The business has just achieved break-even if the entire charge from the worksite precisely matches the home office GC's expenses. Each project team's ultimate objective is to collect enough fees over the breakeven threshold to generate a net profit that may either be distributed to equity partners or reinvested in the business. Although vital, making just enough money to break even is insufficient.

Expenses and Revenue

When are general circumstances not general circumstances? While the phrase "general conditions" is a general one that might signify various things to different people in different circumstances, it is nevertheless crucial that it be used correctly. GCs lack a narrow emphasis, making them generic in nature. When it comes to the home office, the general contractors (GCs) finance the company's activities, which are separate from and do not apply to specific worksite operations. In essence, if there were no building projects, the firm would continue engage in GC operations and incur GC expenditures, but it would eventually go out of business.

Construction Specifications Institute (CSI) divisions 00 and 01 contain general conditions but are often classified as supplementary or special conditions to the contract. American Institute of Architects (AIA) A201 is a general conditions contract attachment to most typical AIA contracts. General overhead, overhead expenses, or overhead costs since they don't directly affect the price of building, indirect expenses;

General prerequisites:

Public institutions often define general conditions or overhead as general and administrative expenses; General conditions are also known as distribu expenses since overhead is allocated throughout all business activities rather than being specifically tied to any one project or construction activity. administrative, operational, or management expenses; Fees for contractors are known as overhead and profit. Contractors might propose a project with a 5% charge if they expected 2% in general conditions costs for the home office and intended a 3% profit; overhead for consulting firms comprises the cost of the job plus profit. The cost of overhead for contractors is not profit-related.

General office settings as opposed to worksite settings. The built environment newbie may find it challenging to understand all of these concepts, some of which are quite similar and others of which are very unlike. To keep them apart, it is simple to add the phrases "jobsite" and "home office" as prefixes, e.g., "jobsite administrative expenses" and "home office GCs." Both general conditions and general contractor are abbreviated as GC by many people working in the built environment. A general conditions estimate may be created in one of two methods. Applying a predetermined percentage to the estimated annual volume generated by the construction activities is the first option, which is quite simple. Assume, for instance, that based on their present backlog (projects under contract but not yet fully invoiced) and projects that are being pursued, the corporate officers expect the business to have a volume of $100 million in 2020 on January 1, 2020. Construction projects this year would need to earn a total fee of $2 million to break even if last year's home office GC expenditures were $2 million and this year was predicted to be comparable. This is equivalent to 2% of the anticipated income of $100 million. To at least merely break even for each job, the firm would need to generate a 2% charge. The following equations may be used to demonstrate this. This kind of imprecise estimation has the drawback of not accounting for variations from one year to the next.

The process of creating a thorough line-item estimate, as was done for the worksite GCs in the previous chapter, is the most accurate technique to create home office general conditions estimate. There are categories for goods and supplies, office equipment, and administrative work and staff in home offices. Everything here resembles the worksite estimate quite a little. Each line item probably contains a number or length, such 12 months or 52 weeks, which is multiplied by labour rates and material unit costs. There is also a condensed home office GCs budget.

Depending on the size of the business and how much management is done at the home office as opposed to the project site, the total estimate may include 100-to-200-line items. Similar to the 80-20 rule that is used throughout this discussion of cost accounting and financial management, the general overhead budget should be specific enough to be tracked but not so complex as to be unmanageable. As each category of office work has a distinct pace, it is best to keep them all separate and not mix them. It would be equivalent to assessing direct building expenditures to estimate the general conditions of the home office. There are historical expenses accessible, patterns are examined, and new circumstances for the next year must be taken into account. The actual costs should be added back to the GCs database at the end of this year to help with future estimations. There are a lot of possible "staff" members for home offices who may or might not be billable to the project. The customer doesn't really care how expenses are accounted for in a lump sum project since it is closed-book, until such costs appear in change order proposals. Certain home office employees and expenditures may be linked to a project in a negotiated project, but it relies on the contract conditions. Evergreen Construction Company (ECC) used the AIA A102, cost plus fee with a guaranteed maximum price (GMP), to complete the Olympic Hotel and Resort project. The cost-reimbursable products are outlined in Contract Article 7 of that agreement, whereas the non-reimbursable items are listed in Article 8. In general, any expense spent on the job site is seen as a reimbursable expense, but any task completed in the home office is regarded as non-reimbursable. Article 7 may be amended as a reimbursable expense to include any additional home office general conditions item or person, but such amendment must be mutually accep and made before the contract is completed. Costs for home office GCs that may be included in the contract include some of the following:

Hoisting superintendents, concrete finisher superintendents, earthwork superintendents, ironworker or structural steel superintendents, and others are examples of specialty superintendents. The project manager is often included as a reimbursable expenditure in Article 7, as was the case with the hotel case study project. The worksite cost accountant was also included as a cost-reimbursable, and the jobsite administration estimate included her salary. In the eResource, you may find a sample of an enlarged yearly home office general conditions estimate for Evergreen Construction Company.

Budget management for the home office's general expenses

The CFO and CEO are in charge of managing the home office general conditions budget, which is not project-based. The contractor wants to lower the volume-based cost of overhead at its home office. Remember that the charge equals the profit plus overhead. The following equations show that if the charge is fixed and home office expenses are lowered, profit is enhanced. The worksite team concentrates on generating revenue, while the home office team utilises that revenue to cover its operating expenses first. Profit is defined as whatever is left over. Smaller-sized contractors often fail due to improper knowledge, recognition, management, and allocation of home office overhead; the following scenario serves as an illustration. Just like they would with worksite indirect and direct expenses, HOOH management's first objective is to ensure that the business stays under its budget. One strategy to do this is to refrain from incurring overhead costs beyond those that were expected on January 1 and included in the yearly budget, such as hiring a second marketing director or purchasing new office supplies. The second objective is to lower overhead expenses, and there are a few ways to do that:

By cutting staff, you may lower overhead expenses. While it is doubtful that wages would be cut, expenses will be cut if one accountant, one receptionist, or one vice president departs in the middle of the year without being replaced. This also holds true for supplies and office

furniture. As much as you can, charge building projects for the overhead of your home office. As mentioned previously, two examples are the project manager's salary and the cost accountant on the worksite. If the construction firm owns the equipment rather being a separate equipment company, it must be used on work sites and charged to projects rather from being kept in the warehouse or corporate storage area. The phrase "Equipment usage and depreciation" will be enlarged to include the necessity for job-costing equipment maintenance wherever practicable. The cost of work consists of both labour taxes and labour benefits. All labour costs, including those related to direct and indirect project labour, must be attributed to the project and calculated on a job-by-job basis rather from being charged to the home office. The cost of labour is included. According to the discussion of breakeven analysis later, overhead is a mix of fixed and variable expenses. While the fixed overhead expenses are not always raised as a company's volume increases, the variable overhead costs are. The total overhead percentage as a percentage of total revenue is lowered if revenue increases only to the point, but not above the point, where a spike in fixed overhead expenses would be required, such as the addition of an administrative clerk or a second payroll clerk.

Assuming a fixed charge, any decrease in home office expenses boosts profit. Yet, a decrease in total costs as a proportion of income also enables the contractor to lower its needed fee and raise the level of competition in their bids and proposals. The preceding illustration had HOOH set at 2%, profit at 3%, and a targeted fee of 5%. The charge (which may be used for bids or open-book offers) might be decreased to 4.5% if HOOH were reduced to 1.5% using any of the previously described methods and the contractor maintained their objective of a 3% profit. The more money generated by the reduced fee should subsequently provide more opportunity to charge more for more projects.

Just because it is simpler, some smaller contractors may assign more of their costs to the home office than do others. They include several percentage markups including labour costs and liability insurance, even for artisans. Personnel who work on many projects in this situation, such as a project manager overseeing five jobs, a structural steel specialist supervisor assisting all projects involving steel, or a quality control inspector visiting 10 tasks each week for a half-day, are all cost-coded to the home office. According to the contractor, "cost is cost." Yet, in an ideal world, each initiative would have its own share, allowing the company to simply communicate which projects were more successful. In negotiated projects, job-costing has a number of benefits over home office costing, which are also covered in this book. There are many options for allocating home office overhead to projects. The most typical scenario is for it to be divided fairly across all of the company's initiatives. If one project represents 50% of the company volume for this year, then one work must earn enough revenue to pay for 50% of the HOOH costs. Every endeavour has its own weight in this manner. Alternative strategies include giving more of the general conditions to projects with greater fee opportunities, distributing them depending on project durations, with longer projects being charged more, or making an effort to subjectively distribute them based on project support requirements. In contrast, if a business just has one building project, it will need that project to cover all of the home office expenses in order to break even. Reorganizing the business and/or office, as shown in Example 2, is another option. Activity-based costing (ABC), which will be presented, is based on the application of overhead expenses to divisions, projects, and direct construction activities.

Breakeven evaluation

At the desired location of the business equity owners. Due to the high risk investment they made in a construction firm, they are anticipating a return on their investment that is above average.

Both home office and worksite general expenses may be seen as a combination of fixed and variable expenses. Fixed overhead expenses are those that rely more on time than on volume or income. The firm pays $400,000 a year in office rent. Office rent is fixed and the same whether the firm generates $1 million in revenue or $500 million in revenue. Yet, these fixed expenses might go up if traffic has significantly expanded to the point where an expansion is required. This can be the case with more office space, a corporate officer, or an accountant. A contractor may find it challenging to lower its fixed expenses in an endeavour to boost its profit margin. Costs of overhead that vary depending on volume are called variable costs. Variable costs are those below-the-line, percentage-added items that would appear at the bottom of a contractor's estimate summary page. They include things like excise tax, liability insurance, and minor tools, or office supplies in the case of home office overhead. Although while the contractor may still require a copy machine (fixed cost), they won't need to put as much paper through it if they have a year with very little work (variable cost).

In 2020, Evergreen Construction Company projects a $100 million volume. A number of line items, most of which are time-dependent, make up the fixed home office general conditions estimate, which is expected to cost $1.5 million this year. The volume-related variable general conditions expenses are projected at 0.5% for the next year. In broad terms, $100 million times 0.5% results in an extra $500,000, or a total of $2 million. A typical breakeven analysis worksheet, combines income with fees, building costs, fixed and variable administrative costs, and other expenses.

Profits

Building excellent projects, adhering to timelines, ensuring everyone's safety, and establishing a solid reputation with customers and subcontractors are just a few of the objectives that contractors set for themselves. Nevertheless, contractors are also in it to make money. Construction is a dangerous business that is not "not-for-profit." The home office will remind project managers of their fee objectives as work on their projects progresses. The fact that the real cost won't be known until the project is finished is one of the peculiar elements of building. Corporate executives at the home office won't be aware of the overall annual profit until the year has ended and all employment expenses and revenues, in addition to the real home office general conditions expenditures, have been taken into account. This section examines how to assess profit, where profit comes from, and how to increase profit.

Techniques for estimating profit

Contractors don't add profits to building estimates; instead, they add a recommended charge. Yet, for certain people involved in the built environment, the proposed fee is seen as the whole profit. The charge is often referred to as the "margin" or, more generally, the "markup." Yet, as we've already explained, the charge must first cover home office costs, and any money left over after overhead is taken into account may be regarded as gross profit. The accounting calculations used to arrive at net profit from the initial contract value are shown in the following formulae. The net profit is what gives the business owners a return on equity (ROE). Another name for net profit is after-tax profit, net income, or "the bottom line." According to the description of financial statements in the next chapter, revenue would be the top line in an income statement. The net profit is then shown on the bottom line after a sequence of expense deductions and subtotals, a summary of which is shown in the following formulae.

A contractor must choose what charge to include when preparing to bid on a project or submit a proposal for a negotiated project. The CEO of the contractor will take the following into account when determining fees:

For a mid-sized commercial general contractor, the charge must at least equal the home office breakeven overhead expenditures, which amount to around 2% to 3% of sales. The greatest estimation risk for any contractor is direct labour. An estimated 50% of the direct labour costs for a commercial general contractor should be covered by the charge. This means that even if the labour estimate was off by 50%, they would still break even. For the project manager and superintendent working on each specific project, there is an opportunity cost. The superintendent and PM are both soft assets with potential for income. They are anticipated to generate revenue for their business. The contractor should pursue project "B" if they are unable to make a profit of $20,000 per month on project "A." It is also possible to include an experienced project engineer or cost engineer in this calculation. Does the contractor need to build up a larger backlog, in which case the charge would decrease, or does the contractor already have a significant backlog? The charge must fall within that range since current market circumstances may suggest that work is being offered today with a fee of 4-6%. Personnel availability, notably for the PM and superintendent.

The choice of fees may be greatly influenced by the kind of contract. Projects that are paid in full carry higher risk for the contractor than projects that are paid on a cost-plus basis. A project that has a set maximum price is in the middle. Several contractual concerns and terms, such as liquidated damages (LDs) and the definition of reimbursable expenses in the AIA A102 contract's , may increase or decrease the price. If there are more possibilities for home office expenses to be reimbursed as work expenses, money may be transferred from the home office general conditions to the jobsite GCs and a reduced fee can be charged while maintaining the same profit target. The client, the design team, and other possible hazards or possibilities might also affect whether fees are raised or lowered. The charge increases with the level of risk. There could not be a pay rate that would make the employment attractive if the dangers are too significant. The contractor may also reduce risks by getting insurance, bonding subcontractors, adding more contingencies to the estimate, or forming a joint venture for a particular project.

Sources of income

A contractor may profit and earn money in a variety of ways, just as there are several ways for them to lose money as well. Here are some illustrations.

Run each business division and every construction project as independent profit centres. One emphasis of activity-based costing is on this. Reduce your home office's overhead as we've already covered. While challenging, this is not the project manager's financial management duty. Increase your output by using direct artisan labour. If the direct-hire carpenters and ironworkers come in under budget, the general contractor is paid more. However this also raises risk, as will be explained in the section on "Cost containment."

Instead, lessen direct labour while boosting the proportion of subcontractors. While reducing risk increases the likelihood of earning the predicted fee, this does not necessarily increase the likelihood of increasing profit. Construction teams or individual crews, including superintendents and foremen, are potential profit centres since some could frequently go over budget. Faster construction reduces costs associated with workplace general conditions. Lean construction aims to reduce rework and build with high quality. All construction mishaps have a cost to everyone. The financial effectiveness of safer initiatives has been shown. The project management team does not immediately impact profits in the same way as the construction team does, but they must be held responsible for returning the projected price if it is not increased. They can do this if given the freedom to take initiative and decide for themselves in the field, independent of home office control.

Effective bid processes, subsequent successful buyouts of suppliers and subcontractors, and fulfilment of stringent contracts. Project types: Some businesses will profit more from retail than others from lodging.

The seamless operation of a project and increased contractor efficiency might make it more cost-effective, according to clients or project owners. The opposite is also accurate. The PM and superintendent are accoun for ensuring client satisfaction, not just for this project but also for referrals in the future. Potential incentive payments for certain projects are based on scorecards that the customer must fill out and which provide the general contractor a bonus depending on numerous performance areas, including schedule, quality, safety, and communications.

efficient use of building tools, such as affordable rental durations, such one week instead of four days, Excellent business choices include renting from external firms, mandating that all equipment be provided by subcontractors, renting from internal equipment companies, and Open-book contract concerns that have an impact on rental rates and equipment maintenance and repair expenses. Due mostly to relationships with subcontractors, some geographic areas, including towns and states, may be better for one contractor than another. It might be simpler to work with certain architects and engineers than others, which can improve cost performance. Reimbursing subcontractors for work that was either completed by the general contractor or another subcontractor, or for work that the general contractor had to fix, guaranteed maximum price contracts, savings splits, Using sliding scale fees, a contractor may charge more for direct work than for work that is subcontracted out and charge more for change orders than for the original contract. There may be hidden costs associated with certain below-the-line markups because the markup applied to either change order work or the initial open-book contract was more than necessary. Although some of these may be found via a financial close-out audit, others are quite difficult to find. This covers markups for things like the cost of labour, liability insurance, data processing, and other expenses. Moreover, claims may be a source of potential profit for certain contractors, but regrettably not for owners and architects.

Ways to increase profits

The contractor wants to meet the anticipated charge first, and then go above and beyond it. An rise in the charge immediately leads to an increase in profit, supposing the home office overhead expenses remain fixed. Yet, profits cannot be reached, much alone expanded, without mechanisms in place to first estimate expenses properly and then monitor them, as demonstrated in the following example.

For a number of reasons, contractors may decide to increase their estimated or bid cost for a certain project, including: Offer a practise bid, while doing so is expensive and could be harmful if the contractor unintentionally ends up as the low bidder; The state of the market permits a greater charge, The kind of job isn't the contractor's area of expertise. The customer may be a high-risk customer who makes tardy payments or files litigation often, Notwithstanding the incompleteness of the construction documentation, which some contractors would see as a chance for a modification order, client-imposed tight deadline, potentially with liquidated damages, Some potentially dangerous contract provisions include high retention withheld or delayed payment periods. If there is sufficient backlog, provide a courtesy bid to a customer they don't want to upset; and Projects that are challenging or complex may need a higher cost owing to the risks involved.

Further markups and additions to the quote

The price is only one of many markups that are included below the line in the estimate

summary. Direct expenses are all of the expected expenditures that are "above-the-line." Other below-the-line elements are percentage add-ons to the estimate that are volume-dependent, like fee, and are thus variable expenses. Rather than the complete direct cost subtotal, the labour load is solely applied to direct and indirect labour. Subcontractors are required to have included the cost of their own labour in their bid rates as labour load is not added to material expenses. Direct and indirect work should have different burden rates. In a construction summary estimate, typical percentage add-ons that will appear below the line are labour costs, liability insurance, excise tax, sales tax, contingency, and fee.

The process used to create the home office general conditions estimate is similar to that used to create other estimates in that it consists of a number of line items, including labour and material, office rent, and equipment. The applicable salary rate or unit price is multiplied by the amount or duration for each of those goods. Moving home office operations to the worksite where, on cost-reimbursable projects, they would be able to be paid out of job cost, if the contract wording permits this, is one method the home office will attempt to cut its overhead expenses. Along with reducing the number of GCs working from home offices, there are several other approaches to increase a construction company's profit potential. You have to keep your eye on the prize, and the reward is the fee, which includes profit, as a close friend and fellow project manager once advised this author.

CHAPTER 5
FINANCIAL STATEMENT

[1]Dr. Gopalakrishnan Chinnasamy, [2]Vyshnavi A
[1]Associate Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.gopalakrishnan_c@cms.ac.in, [2]vyshnavi_a2015@cms.ac.in

In order to connect and communicate with all of its internal and external financial stakeholders, including the contractor's bank, bonding company, or surety, chief financial officer (CFO), other company officers, board of directors, and investors or equity partners, financial statements are necessary.The general ledger, job cost ledger, and equipment ledger are the three main ledgers used in construction cost accounting. The balance sheet and the income statement are the two crucial financial statements that make up the general ledger. New project engineers (PEs) and project managers (PMs) will not be asked to produce or even manage these records, nor will students of cost accounting and financial management. The CFO manages corporate financial statements, which is undoubtedly a senior management task, but the PM should be aware of the distinctions among some of these records and how they apply to worksite financial management. This will cover these financial statements as well as introduce some of the financial ratios that are developed by contrasting various line items and reports. Journal entries are internal accounting transactions that transfer funds on paper (or in this instance, electronically) without changing the overall balance. Future chapters will also cover various financial reports produced by the home office accounting department that are project-related and used for cost-control initiatives. All of these records and tools support the contractor's ability to make both immediate and long-term financial decisions.

Sheet of balances

The general ledger is a non-job-based report that covers the whole organisation, like many of these financial reports. The balance sheet, which is covered in this part, and the income statement, which is covered in the next section, are the two crucial financial statements that make up the general ledger. A chart of accounts is used in the general ledger; it is comparable to the cost codes used in the initial construction estimate and for cost management, but it differs somewhat from worksite codes in that it is not based on the divisions of the Construction Specifications Institute. As shown in the following list, the chart of accounts for the general ledger is often merely a three-digit code, although there may be differences depending on the building sector and the particular contractor. There are no set restrictions as to which specific numbers must be utilised, similar to cost codes. The following coding system is used by our construction company's certified public accountant (CPA):

The balance sheet for Evergreen Construction Company (ECC) is shown in a condensed form.

The company's net value is shown on the balance sheet. This provides an instantaneous response to the fundamental question that so many of the stakeholders previously stated asked: "How much are we worth?" The balance sheet is dynamic; it is always shifting and in flux. It is an overview of a contractor's financial situation. Every check that is issued and received has an instantaneous impact on the balance sheet. The three main sections of the

balance sheet are assets, liabilities, and owner's equity, or net worth, and they are represented by general ledger numbers 100–399 on the balance sheet. Liabilities are negative entries on the balance sheet, while assets represent positive entries. Assets reflect what a contractor 'has' and liabilities reflect what the contractor 'owes.' Since liabilities must be subtracted from the asset total, the sum of all the assets does not provide an answer to the earlier "worth" question. Worth is defined as what is left over, or in this example, the owner's equity. The owner's equity does not necessarily reflect what was initially invested, but rather what that investment is worth at any particular moment of time. The key to the balance sheet is it must 'balance.' The sum of the assets will always exactly equal the sum of the liabilities plus owner's equity. If there is an increase on one side of the ledger, there must be a corresponding increase on the other. The balance sheet equation is reflected as:

Assets are categorised either as current assets (also known as short-term assets), versus fixed assets (also known as long-term assets) (also known as long-term assets). Current assets are those held for less than a year and include primarily cash or accounts receivables. Receivables for a construction company are defined as invoices processed but not yet received from its clients. Current assets are also considered liquid assets in that they can be converted to cash within a year or less. Fixed or long-term assets are those which are held for a year or longer and include buildings, furniture, and construction equipment. As will be discussed in upcoming, 'Equipment use and depreciation and, 'Developer's pro forma,' construction companies generally do not hold a substantial amount of fixed assets. Instead they organise separate independent companies which own and manage them as independent profit centres in addition to, but legally separate from, the construction company. These separate entities are known as limited liability companies (LLCs) (LLCs). Liabilities are also split between current and long-term liabilities. The comparisons are very similar to assets, except they reflect negatively on the balance sheet instead of positively. Examples of current or short-term liabilities are those owed or payable within one year and classified as accounts payable. Accounts payable for a contractor includes money invoiced by subcontractors or suppliers but not yet paid, and time incurred by, and wages owed to, the contractor's employees. Loan payments owed on buildings and equipment are long-term liabilities.

The remainder, after liabilities are subtracted from assets, is the owner's equity, which is also known as net worth or stockholders' equity. The original owner's equity was the initial investment, in the form of cash or capital, made into the company by one or more partners. The current owner's equity reflects the value of the investment as of the date of the balance statement. The owner's equity is shown among the liabilities on the balance sheet as the company essentially owes that money to the owners. If the company would dissolve at any given point of time, the assets would be sold and used to pay off the liabilities and the remainder would be owed and distributed to the owners. There would not be anything left over after that; the assets and liabilities effectively balance out. During a good year, after the owners have taken their dividends out of the after-tax net profit, some of the profit may remain in the company as retained earnings but still carried within the owner's equity portion of the balance sheet. Retained earnings can be used in the future in a vari- ety of fashions including: company expansion into a new market or with additional office space, equipment purchases, or carry the retained earnings forward in case next year's profits are not as good as was this year's.

Income statement

The income statement is a sum total of all of the business that the company did for a period of time, usually one fiscal year. It can also be prepared quarterly or monthly. The income statement combines revenue and cost and is also known as the profit and loss statement. The

income statement reflects the differences between two balance sheets which were both snapshots in time. General ledger chart of accounts codes 400–699 are covered in this statement. Revenue is the money which came into the company or total volume of business. This is how much was 'earned.' Cost is the money which left the company, in the form of expenditures, or how much was 'spent.' The income statement does not reflect cash flow for most contractors, other than those small firms which use the cash accounting method, but rather committed costs and earned income. The income statement will not balance out to zero as the balance sheet did, at least the contractor hopes it doesn't sum to zero. Rather the income statement should reflect how much profit the company made for the year or period reported. The income statement equation is reflected as:

Many of these equations are used in different chapters throughout this study on cost accounting and financial management. Some jobsite construction teams feel that their contract amount is how much they contributed to the bottom line; they built a $24.5 million hotel therefore they contributed $24.5 million. But as reflected by the series of formulas earlier – starting with revenue, or contract value, of $24.5 million – the amount which is left, after all costs are deducted, which contributes to the owner's bottom line in the form of additional owner's equity as discussed with balance sheet earlier, is very small. Even the profit is not pure profit. Gross profit, which is what is left after cost is deducted from revenue, is subject to taxes, which was changed for 2018 to a flat 21% for a construction company. After tax, profit is also known as net profit or pure profit.

Financial ratios

Financial ratios are a mathematical means to analyse all of the different ledgers and financial state- ments produced by and available to the company. These ratios and formulas provide an insight to the contractor's financial health beyond just the statements discussed earlier. An entry of $500,000 in any line on any of the statements does not tell the whole story without comparing that figure with other entries, possibly from other statements. Often ratio averages or trends are developed from two or more statements. There are many formulas available for bookkeepers, CFOs, banks, and CPAs. Financial ratios are also very important to real estate developers seeking investor contributions or bank loans. Different stakeholders have interest in different ratios. Construction project managers again will not be using these ratios, but it is important that they have a general understanding that a) these financial ratios exist, and b) financial transactions at the jobsite level have some impact at the corporate level. Most of the ratios are based upon line-item entries in the balance sheet and income statement. Some ratios compare items within one statement and others compare items between the two statements.

The built environment industries rely heavily on the construction industry, which has a number of distinct sectors or sub-divisions, the most important of which are: residential, commercial, heavy-civil, and industrial. Depending on the industry the contractor specialises in, there will be a range of accep financial ratios. A heavy-civil contractor's response will be different from a residential contractor's, and general contractors will have different answers than subcontractors or specialist contractors. One ratio and one year are also not accurate indicators since they just represent a single point in time and reflect a limited viewpoint. It is better to examine various ratios throughout time to check for trends. Numerous contractor and accounting associations and publications, such as the Association of General Contractors (www.agc.org), the National Association of Home Builders (www.nahb.org), Engineering News Record (www.enr.com), and the Construction Financial Management Association, report preferred ranges of many of these financial ratios (CFMA.org). Usually, financial ratios are divided into groups. The four most prevalent ones are liquidity, profitability, efficiency, and leverage. To discuss every financial ratio that exists would need a long book

since there is literally no end to the list. The ratios that are most crucial to the financial stakeholders of a construction firm are listed below.

Diaries entries

Cost accountants enter financial transactions into the accounting records. The act of posting is the entry of financial data into books, which are accounting statements or ledgers, some of which are covered in this article. Cost accountants shift money by posting, at least on paper, from one account or cost code to another using journal entries. Without an authorised change order included, the net impact of journal entries must be zero. Without processing bills on the worksite, the home office accounting staff enters certain charges into the job cost system. The proportionate share of markups to direct costs for each project, such as home office overhead, labour burden, liability insurance, and excise taxes, are among these. They also include items like company-owned equipment, administrative labour such as project manager and superintendent, and company-owned assets. Sometimes, open-book customers have trouble keeping track of home office journal entries during a project audit. In March, a cost appears under one cost code, then in August, it is transferred to a different cost code. Or expenses that were incorrectly first coded to one project are moved to another project. After receiving financial reports from the home office, the worksite crew also completes journal entries.

Work cost accounting statements

The monthly work cost history report, weekly labour reports, and an equipment ledger are a few of the task-focused reports produced by the home office accounting department that are not company-related. Financial management and cost accounting include several positive and negative instances. It's been stated that failures teach us more than victories ever could. There are three further instances of contractor financial reporting in this area that may have been enhanced. The job cost ledger is another name for the work cost history report. This report keeps track of all expenses that have been coded to a certain work number. The report, which includes all of the expenses from the previous month, is released around the tenth of the month. This report is the result of the worksite financial team's cost coding of all the labour time sheets, material bills, and subcontractor invoices. The monthly task cost history report will now include the entries from the home office notebook. The jobsite cost accountant reviews the home office-generated job cost history report each month to ensure that no costs from other projects were unintentionally posted to this project and that the cost codes he or she entered on time sheets and invoices the previous month were properly input by the home office accounts payable clerk. There will always be cost coding mistakes, and it is crucial that they be fixed right once to have an accurate view of the project's current expenses. This will be useful later when entering the as-built estimate and the monthly cost prediction. The cost codes written on time sheets, material and subcontractor invoices, and schedule codes and file codes used in the initial budget estimate should all be utilised consistently throughout the whole organisation. They are distinct from the general ledger chart of account codes that were previously established. Coding mistakes must be quickly fixed using the journal entry procedure.

Weekly labour statistics

A component of the work cost history report, the weekly labour reports only include direct and indirect jobsite labour. The general contractor doesn't monitor the labour of subcontractors. Labor reports are produced more often than material and subcontractor cost reports because labour is the most unpredic and challenging cost category for a contractor to anticipate and manage. On Tuesday of the following week, probably after expenses have been spent, they are normally created by the home office and sent to the field. This will

provide the worksite management team the opportunity to amend or change the field cost control system as needed.

Instrument ledger

The goal of all construction equipment used by contractors is to be job-costed, not invoiced or cost-coded to home office overhead. Included in this are costs for maintaining and repairing company-owned property. A unique tracking number is issued to each piece of equipment. The home office accounting department may build and maintain a firm equipment ledger. Heavy-civil contractors are more likely than commercial contractors to possess equipment. A lot of commercial contractors will establish a separate business that both owns and hires out equipment for their operations. The corporate leaders who work for these equipment firms are formed as partnerships or limited liability corporations. The activities of the equipment firm are maintained outside from tax and liability concerns of these companies. But, it's possible that one person working in the home office's accounting division really works for the independent equipment firm and is in charge of the equipment ledger. The site management team may send invoices to the worksite for cost coding, or the equipment clerk may just journal-enter costs into the project cost history report.

The general ledger, which contains the balance sheet and the revenue statement, the work cost ledger, and the equipment ledger are the three main financial statements. By definition, the balance sheet must be in balance. Both assets and liabilities make up it. Owner's equity, which is sometimes referred to as the company's current net worth, is included under liabilities on the balance sheet statement. The balance sheet is always evolving. There must always be a commensurate rise on the opposite side of the ledger whenever there is an increase on one. The company's total revenue and total expenses for a fiscal term, such as a year, are shown in the income statement. The bottom line of the income statement represents profit after expenses are subtracted from revenue, as contrast to the balance sheet's bottom line of zero. The construction business anticipates reporting a profit at the year's conclusion. For internal and external stakeholders, such as certified public accountants, auditors, and the Internal Revenue Service, consistency in the creation of financial statements is crucial.

Equity partners and the bank are only two of the numerous stakeholders in the contractor that employ financial ratios. These ratios evaluate entries from both the income statement and the balance sheet. These mathematical ratios serve as a multiple-level indicator of the contractor's financial health. The contractor's home office accounting department produces a number of financial management reports that help the worksite team with cost control and forecasting. To provide the worksite team a fair image of its cost status, any inaccuracies in these reports must be journaled out and shifted to the appropriate cost codes as soon as feasible. Journal entries are paper debits to one code and credits to another code rather than real currency movements. Like the balance sheet, the total of all journal entries should equal zero. Together with the work cost history report and weekly labour reports, the home office accounting department also generates financial data that may help the cost-control efforts of the jobsite teams. While there are many more ledgers, statements, schedules, and spreadsheets that are a component of financial accounting for the construction industry, this presentation was restricted to those that have the most impact on the worksite crew. Several of these financial statements are used by the worksite team to try to meet their share of the company's financial objectives in the next on cost management.

Control of costs

Construction is distinct from other industries, as was already said. One aspect that makes it special is that a contractor won't really understand a building's cost until it is completely

finished. While the contractor agrees to the price up advance, there is no assurance they will be able to complete the project at the agreed upon sum. One of the main justifications for cost containment is this. Other motivations or goals for cost containment include:

The cost cycle, which starts with estimate formulation and ends with entry into the estimating database. Once again, the efforts to control costs on the worksite are more important than those in the home office, but there is always a link between what the project management team performs on the jobsite and the needs of the home office. A crucial component of the second stage of cost containment is the buyout of subcontractors. It's not always the case that the general contractor's (GC) or the subcontractors' (SC) bids to the GC are precisely what the GC contracts with SCs for. The estimate, time, and equipment and materials required to enable the foremen and craftspeople to effectively construct a project component are communicated via work packages. The worksite team won't truly have a realistic view of the cost of the work compared to how it was projected if all expenditures for personnel, supplies, equipment rental, and subcontractor invoices are not cost tagged correctly. For all construction management (CM) control duties, including cost control, the project manager (PM) and worksite cost accountant input to the home office with a range of reports. The chief financial officer (CFO) and chief executive officer (CEO) utilise the monthly fee projection to communicate with external stakeholders, such as bonding and banking strategic partners, and to update the company's financial statements.

Cycle of cost management and link to accounting procedures

In a typical contractor's cost control cycle, there are five stages. The preparation of the setup or estimate, correction or adjustment of the estimate following buyout and input to the cost control and accounting system, recording or monitoring costs, including cost coding, modifying the system if costs are not being achieved, and preparation of an as-built estimate and input back into the company database for use in the subsequent estimate are a few examples. An accurate estimate and timeline are the first steps in the first phase. Phase one will only be completed if the contractor is successful in its offer or proposal to the customer. If the customer notifies the contractor that the project has been successful, the contractor must first confirm the accuracy of the estimate, make any required corrections using a number of techniques, and then input the information into the corporate cost management system. After the contract is signed, the home office accounting department will provide a special task number. The next portion of this discusses the first two stages of cost control. The creation of foreman work packages is a helpful cost planning technique. Actual expenses incurred during phase three of construction are noted and put into the accounting system as accounts payable. In phase four, issues with the project's cost control systems are identified, any required corrections are made, and progress is reported to the home office. The project plan, as well as the cost management and accounting systems, must also account for change orders. This also covers phases three and four. The creation of the as-built estimate is the fifth and last step in the cost management process. The building project's financial close-out. The cost control cycle shows each of the five cost control stages. This book on cost accounting and financial management will explore the same cost control throughout.

Cost base establishment, including buyout

The estimate is put together using measured material quantities, market-rate material unit costs that are competitive, historical direct labour productivity rates, current direct labour pay ranges, competitive subcontract quotations, and a number of markups and fees. The initial estimate should be put together by work packages, and each line item should be given a unique cost code in order to better prepare the worksite management team for cost control. No timeline or estimate is ever accurate. The estimate must be revised with real subcontract

and purchase order buyout values and entered into the company's cost management system when the contractor gets news that its bid or proposal has been accepted. If the estimator makes any errors, they must be fixed right away, maybe with journal entry changes to the fees or contingency money. With an inaccurate estimate, the superintendent and worksite crew cannot start construction or make effective cost management measures.

The buyout of subcontractors and suppliers is a crucial step in the estimate rectification process before it is fed into the cost control system. The general contractor issues thorough requests for proposals and/or quotes (RFPs and RFQs) to prospective subcontractors as the first step in the buyout process. Only qualified businesses should be asked to submit bids for subcontractors after being "vetted." When bids are received, they should be compared on more than simply price alone. The drawings and specifications should be carefully examined when subcontractors are invited to the general contractor's office or when the GC visits the subcontractor's place of business. Instead than arguing about conceivable scope gaps while the project is being built, any prospective bid qualifications or exclusions should be agreed upon now. Only "best value" businesses with comprehensive pricing, scopes, quality, safety, and schedule plans that fulfil the GC's requirements should be given purchase orders and subcontract agreements. The CEO and CFO are concerned with the markups since they are beyond the worksite team's scope of control and include home office costs. If suppliers and subcontractors were carefully sourced and contracts were established with strict terms, there would be nothing to "manage" in terms of their costs. Direct materials should have had competitive pricing applied after being precisely assessed. Cost exposure for materials is also restricted since the superintendent cannot place less concrete in the footings than was planned in order to save money. The majority of the components in the jobsite general conditions estimate are controllable, but time is the largest unknown; if the project lasts longer, jobsite general conditions will exceed the budget. If feasible, construction equipment should be cost-coded to direct tasks rather than generic circumstances. Equipment utilisation and depreciation calls for effective equipment management. The bulk of attention should be paid to direct labour in any discussion of construction cost management since it is the hardest variable for the estimator to anticipate and the hardest for the superintendent to "control."

The supervisor is in charge of controlling or managing the cost of direct craft labour and equipment rentals, sometimes with the aid of a field accountant or worksite cost engineer. Getting the foremen and superintendents personally committed to the process is essential to getting them engaged in cost containment. One effective strategy used by the general contractor to do this is to engage the superintendent in the estimation process from the beginning. If the supervisor specified that it would take five carpenters three days of labour to construct the spot footings, he or she would make every effort to ensure that it was done in that amount of time. Several industry leaders in construction feel that superintendents shouldn't be informed of the actual planned cost of each work package. Since the foremen and superintendents play important roles in the project team and the project's financial performance, this is a bad practise. These individuals, who are thought of as the final planners, should be given the actual budgeted cost for installation, including the materials and man-hours (MH) required, as well as the anticipated time required for installation for each work package. This example does not divide the direct work by craft or work package as will be detailed later; instead, it has integrated all of the direct labour into a single curve. The worksite cost engineer may assist with this. It is crucial that the superintendent or foremen keep track of the actual hours worked each week and compare them to the estimate. It is thought that the foremen and their crews are either exceeding the estimate or running behind schedule if the actual labour utilised is below the curve. If the hours are above the curve, the reverse is true. While the project team receives fast and favourable feedback using this

straightforward approach of documenting the man-hours, it has several drawbacks that will be covered in the upcoming on earned value. When tracking direct work, using hours rather than money is preferable. This is one benefit of using MHs for labour estimation rather than labour unit costs. Foremen and superintendents consider the number and length of the workforce. They have one carpenter scheduled to labour for three hours to install the bath mirrors instead of thinking in terms of $100 per person.

The stringent Construction Specifications Institute (CSI) format is how many in the construction business, particularly consultants like estimators, organise their contract documents. All cast-in-place (CIP) concrete is grouped together in CSI division 03 for concrete and is not structured in the estimate according to systems or assemblies. All concrete foundations, slabs-on-grade (SOG), columns, raised decks, and walls are thus categorised as a single category. Even combining off-site precast concrete with on-site CIP or tilt-up concrete may fall under this category. Contrarily, even if these tasks are carried out alongside the CIP concrete, any work that may be specified in another CSI division, such as structural excavation and backfill, footing drains, or structural steel embeds, will not be grouped with the concrete work. Work packages or assembles may provide the first estimate, schedule, and supporting work breakdown structure (WBS) more quickly and effectively than a pure CSI method. Work packages are a way to divide the estimate into separate assemblies, systems, or packages that correspond to quantifiable work tasks. For instance, a work package may include formwork, reinforcing steel, and concrete installation for concrete footings. The job is scheduled in accordance with the estimated number of hours and is observed to gather feedback. The superintendent and the management group will get quick input on cost control after the footings are finished.

This benefit of planning building by assembly or work packages rather than CSI is also shown in other direct work domains. The contractor will get instant feedback on how the initial budget and timeline appear after an assembly, such as wood framing, which is a component of CSI 06, is finished. Rough carpentry, blocking and backing, finish millwork, and cabinets would all be included in CSI 06, and if they were all grouped together, the contractor may not know how the initial budget was shaping up until the whole project was finished. Here as everywhere in cost accounting and financial management, the 80-20 rule is applicable. These operations demand the greatest cost management attention since they account for 80% of the cost and risk. The project team on the worksite should assess and reduce the biggest risks. To determine which components or systems have the greatest direct work labour hours, the estimate should be examined. For those issues that the cost control team feels are important to watch and keep an eye on, work packages should be produced. The foreman in charge of carrying out the task should create each work package, maybe with help from the cost engineer. Simple, straightforward assemblies like the following are warranted for work packages in the hotel case study:

Contractors conceptualise their work as "assemblies" or "systems." The idea of work packages is combining all components of the job into a single assembly, independent of the supplier, specification division, or installation craft. The contractor will then be aware of the assembly's cost and placement within the project time. The contractor, and in particular the supervisor, are the rightful owners of the building tools and techniques. The superintendent effectively organises the manpower, tools, and supplies required to complete the project. This is an example of a work package for erecting the door frames for hotel guest rooms, hanging the doors, and installing door hardware and signs. The superintendent is meeting with Joe, his carpenter foreman, to organise the project and give him the work package for assembly in this scenario. They could discuss and take the following into account while planning an effective operation: The foreman receives a list of suppliers and their contact information, including

phone numbers and email addresses. Dates for supplier deliveries are listed. The task trailer should include copies of all content submissions that have been approved. A floor-by-floor assembly area has to be set up, and hollow-metal hallway door frames need to be grouted. They do not intend to relocate grouted frames within the structure vertically. They will be substantial, and the workforce will get safety instruction. Frames and door leaves that are fire rated must be manufacturer branded. On the restaurant's shelled first floor, the general contractor will erect a closed and monitored door hardware room. There will only be access for Joe, the carpenter foreman, and Roger, the super- intendent of Evergreen Construction Company. Joe is informed that the projected number of hours and weeks for this job package is 432. Three carpenters will be working as a team to install this work, and a fourth worker will be assisting with grouting the frames, setting up the stage, and cleaning up. The hotel rooms don't have any door locks, although some of the public spaces on the first floor have.

The foreman is informed of cost codes, expected labour hours, and scheduling milestones. The foreman will bill his time at a rate of 100% for the labour and divide his time between organising his crew's supplies and installing doors while wearing a tool belt. One toolbox per crew member will be kept locked up each night on the floor they are working on. One day before the team is finished, one carpenter will leave the floor and start layout on the subsequent floor. To prevent damage, the crew won't put door signs up until a week before the punch list. The temporary signage will be cardboard room numbers. This labour package will provide twenty hours for signage. This is only an illustration of a few of the components that may be included in a single simple work package; the foreman will undoubtedly want extra information and specifics. Even more complex work packages would need to be prepared for systems like raised concrete decks, structural steel, wood framing, siding, or roofing, but they are all required to ensure a successful building operation. a sample work package for cost control from the foreman. Before, there existed a thorough estimate for this system.Costing for direct labour, materials, and contracts

Assigning cost codes to the work components found during the work breakdown stage of the cost estimate is the first step in cost management. One of the first phases in estimate development is WBS creation. These cost codes make it possible for the project manager, cost engineer, and supervisor to keep track of actual costs and evaluate them against projections. The goal is to guarantee that the overall cost of the finished project is less than the expected cost rather than for the team to strictly maintain the cost of each component of work beneath its estimated value. Monitoring project costs, identifying problem areas, and choosing mitigation strategies are a few uses of actual cost data. Other uses include processing change order proposals, identifying additional costs brought on by changes, and calculating costs for finishing work that was a subcontractor's responsibility. Give a cost report to the project client, which may be required under an open-book contract; assess the efficiency of the project management team on the worksite; and Create a database of past cost information that may be used to calculate the cost of future projects.

Price codes

Costs must be carefully recorded and compared to the revised estimate in order to be controlled. Recording real expenses spent and entering them into a cost control database come first. To compare actual cost data with projected values, cost codes are employed. In the business, cost codes come in a variety of forms. In order to compare real costs once a project is completed and integrate them into a useful estimating database, it is important to first ensure that all projects within a corporation utilise the same cost coding system. The cost code system need to be uniform with other systems of codes, such as those for files, subcontracts, and purchase orders, as well as for estimating and scheduling. The specific

work number, a designator of labour vs material versus subcontractor cost, and the specification number are examples of components of a cost coding system. Some contractors will use the Construction Specifications Institute-like RS Means cost codes. The general contractor may carry out project cost accounting in the field or in the home office, depending on the size of the construction company, the nature of the work, the type of customer, and the contract agreement. In general, the likelihood that all accounting tasks will be carried out in the home office increases with the size of the company and the contract value. The project team may include a worksite cost accountant for bigger projects. Where the construction company does cost accounting may also be influenced by the kind of contract and how it handles reimbursable expenses.

CHAPTER 6
COST CODES

[1]Dr. Madhavi. R, [2]Umakanth S
[1]Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Professor and Hod, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]r.madhavi@jainuniversity.ac.in, [2]umakanth@cms.ac.in

The majority of the accounting tasks on a project remain the same, regardless of where the cost information is gathered and where the checks are written. With an updated estimate, the procedure starts. Then real expenditures are incurred, whether via direct labour, material purchases, or invoices for outsourced work. In the time sheets and invoices, cost codes (those that correspond to the estimate) are noted. The cost engineer often starts this procedure. The superintendent and project manager are then given the coded time sheets and bills for approval. For cost-plus projects, the customer or the officer-in-charge may sometimes additionally wish to provide their first consent on each invoice. The cost data is entered into the cost management system once the time sheets and invoices have been tagged and authorised. The precise coding of real prices is a crucial component of this cost recording step. The project team won't truly know how they are doing on that particular piece of work if expenses are mistakenly or purposefully entered wrong. Some superintendents may instruct their cost engineers to purposefully code expenses against things where there is money left over rather than necessary against the proper job activity, disguising overruns in the process. If coding mistakes happen, the workers on the workplace won't be able to watch over and improve the building process. To provide the project team an accurate accounting of expenses, all costs must be entered appropriately. The two examples that follow emphasise the need of precise cost coding.

The step of cost management that takes up the greatest space and time is cost recording. If available, worksite cost accountants and project engineers are often responsible for recording actual costs. The cost engineer participates in cost recording in a number of ways, including: Forecasts for monthly projects sent to the home office

Depending on the culture of the construction business, the complexity and scale of the project, the contract conditions, and the specific team members engaged, the degree of autonomy every worksite project team has from the home office varies. The distance between the worksite and the home office was a significant factor in the hotel case study, particularly with regard to jobsite cost accounting. In any case, the home office will always provide advice and direction to the worksite as well as reporting responsibility from the jobsite back to the CEO and CFO. As previously said, there is seldom a "perfect estimate," and despite management's best efforts, many construction projects won't progress "perfectly" in accordance with the original plan and time. Constantly analysing actual expenses reported against the estimate will reveal discrepancies that the project team should pay attention to and maybe alter. The contractor must know whether or not it earned money before the job is complete. There is nothing that can be done to resolve the issue at that time. Expenses might

go above budget for a number of reasons, including: The worksite team may need to modify the plan or procedure after the source of the cost overrun has been identified; fortunately, the issue was identified in time for an adjustment to be put into place. The following are some examples of corrective measures, or "fixes," that could be taken: Use different techniques, tools, or equipment; enforce subcontract agreements; prevent back-charging of subcontractors; change the personnel of the in-house general contractor; change the subcontractors (this is difficult to do); change the client's order; accelerate the time, orselective overtime use: occasionally spending money might result in a financial savings.

A monthly projection for the project must be created by the project manager and communicated with the superintendent and officer-in-charge. With the help of the project cost engineer, field foremen, and superintendents, this should be developed. The monthly prediction could be important to the bonding and banking parties for the contractor. In the event of a negotiated cost-plus contract, the customer may be copied in on the monthly prediction. This prediction comprises line items for each estimate's component parts, costs incurred so far, and projected completion costs. A separate forecast page is provided for each of the main work categories, and each of those pages is broken down for all subcategories of labour. As previously said, the direct labour, material, equipment, subcontractors, and general worksite conditions are the primary areas of the estimate. A series of mathematical computations are used to build the cost prediction, and each one produces a more accurate projection of the expenses than the first estimate provided before the project began. The forecast spreadsheet adheres to the standard and uses a straightforward set of Excel rows and columns. The following procedures are involved in creating the monthly project management cost forecast:

Begin with the initial or agreed-upon estimate. The amount in this column should precisely match the contract's initial value. The following column only includes change orders that have been authorised. There is no assurance that pending or unapproved modification orders will be included in the contract value, thus they shouldn't be included here. The current contract value is calculated by adding columns three and four in the fifth column. Actual expenses as reported from the monthly work cost history report are shown in the sixth column. The hardest column is the next one. The preceding columns were all simply copied and pasted from other accounting reports or sent from normal math computations. The project team must provide a knowledgeable projection of how much money is still remaining to be spent in the seventh column, which is labelled "forecast." The following methods of developing the forecast are optional: Just enter the amount of money that has been contracted but has not yet been spent so that each line item will total up exactly and have a $0.00 variance. This may be achieved by configuring the columns to calculate the to-go cost automatically. For instance, if the initial budget was $2,500 and $2,200 has already been spent, there is still $300 to pay. Utilizing a trend analysis, the team would have $25,000 remaining to spend if they still had 500 cubic yards (CY) of concrete left after spending $500 per CY on the first 1,000 CY. Math formulae may also be used to generate this easily. Assuming that the starting production rate was carefully considered, multiply it by the amount to be completed. If 100 MBF of rough framing was anticipated to take 14 man-hours (MH) per 1,000 board feet (MBF), but 16 MH/MBF had already been spent on 80 MBF, then 14 MH/MBF, the initial productivity rate, is multiplied by the remaining 20 MBF without taking the rate trended into account. Understanding the amount to go and making an informed judgement of the productivity required to complete that activity with feedback from the foremen and supervisor are the two most accurate ways to calculate expenses to go. Line each line should be addressed in this manner.

While the first three of these techniques are simple to use, they are all somewhat ineffective.

Issues with the learning curve could have existed. Cost code mistakes might exist. There might be altered circumstances. For certain line items and in some places, different forecasting techniques may be employed. Samples of each of these forecasting approaches, including over- and under-running the estimate scenarios, for the construction of structural steel beams for the Olympic Hotel. The total prediction, which sums columns six, cost to date, and seven, cost to go, is shown in the eighth column. Based on the most recent information they know, the project team has estimated the project's final cost, which is represented by the sum at the bottom of the total projection column. This prediction becomes increasingly precise month every month. A variance column appears in the last column. It deducts the approved and updated contract values from the overall prediction. A positive number shows that the contractor is coming in under budget and will thus enhance its fee position; a negative number (typically in red) shows that there will be an increase in costs. The contractor's fee is projected as the last computation in the projection, taking into account all of the individual line item deviations from column nine. The project team is given the go-ahead by the home office to meet or exceed their initial fee proposal. To include estimate correction journal entries and subcontractor buyouts, two extra columns might have been added to the forecast worksheet between columns three and four. However, they were left out of this example for simplicity as the sum of the journal entries would have been zero. The website for the hotel case study project's monthly forecast report. The whole prediction, which may include 10–20 pages and hundreds of line items, is sometimes just as lengthy as the initial comprehensive estimate. An explanation of the significant deviations from the previous month's projection, together with a work plan for maintaining or enhancing performance for the duration of the project, should be included with the monthly forecast. The financial reports must be consistent in order to provide the home office a clear picture of project progress and to help them build trust in the worksite team. This is a key principle of construction cost accounting. The management group cannot afford to measure and disclose the total project cost once the project is finished. Not only is it too late to make corrections, but it's also too late to pinpoint exactly why the team veered from the original strategy. The project manager who provided the following example is unduly pessimistic. Depending on the procedures followed by the construction company and the demands of each given client or project, additional management reports may be produced by the worksite team or the home office accounting department. The weekly labour report, monthly work cost history report, equipment log or ledger, and accounts payable report are examples of common cost accounting and financial management reports. The majority of reports are computer-generated, and they are reliable to the extent that data on real expenses was submitted appropriately. These might happen every week or every month, but The construction cost cycle consists of five steps: estimate setup, adjustment or correction, including buyout, cost recording after construction begins, system modification if necessary, and creation of the as-built estimate once the project is finished. Site supervision may organise their work and perform cost control using work packages. The cost estimate in terms of direct labour hours and completion time must first be provided to the foremen in order to prepare these. Access to the right installation supplies and construction equipment is also necessary for work package execution. Cost codes work in accordance with the cost cycle from beginning to end. The same cost codes must appear on the price recapitulation sheets for the estimate, be added to subcontracts when they are signed, recorded on time sheets and material invoices, and entered back into the corporate database after the as-built estimate is finished. The worksite financial team must identify the root cause and take fast action if they determine that they are falling short of their cost or schedule targets for whatever reason. This might need changing the procedure, using alternative tools, or even changing the staff. It is too late to wait till financial reports produced by the home office go to the field. Using work packages and doing

as much cost accounting as is practical on the worksite has this benefit as well. A monthly cost and fee prediction report is created by the project manager for the home office. This is effectively a brand-new estimate for the project that takes into account both actual expenditures and anticipated completion costs. Each line item has to be examined separately, taking into account variables like the amount to go and learning curves. With internal equity partners and external stakeholders like the bank and the guarantor, the CEO and CFO will most likely discuss project predictions, at least on a summary level. Hence, consistency and precision are crucial for reporting building costs. The following is totally dedicated to that more complex subject. Earned value is another cost management technique that is often used in conjunction with the information presented here.

Create a cost prediction for the tasks from Assuming the above percentages completed and spent, estimate the number of hours still required and determine the overall overrun or underrun this project will experience. Use 18 wage rates or other local current rates to convert the hours to dollars. Write down any potential causes for the overruns or underruns, as well as any necessary remedial measures. Determine the historical as-built unit man-hours if everything progresses in the same manner (at the same pace as it has been).

Costing for materials, labour, and contracts directly

The first step in cost control is to provide cost codes to the work components that were identified during the work breakdown stage of the cost estimate. One of the first phases in estimate development is the creation of the WBS. The project manager, the cost engineer, and the supervisor may track actual costs and assess how they differ from projected expenses thanks to these cost codes. The team's goal is to make sure that the entire cost of the finished project is less than the expected cost, not to strictly maintain the cost of each component of work below its estimated value. Actual cost information can be used to: Track project costs, spot any issues, and choose mitigation strategies; Determine additional costs brought on by changes and handle change order requests; Determine costs for finishing work that was a subcontractor's responsibility; and handle related back charges. Provide the project client a cost report, which can be required under an open-book contract; assess the efficiency of the worksite project management team; and Create a database of past cost information that may be used to forecast future costs.

coded prices

Costs need to be precisely recorded and contrasted with the revised estimate in order to be under control. The first stage is documenting the actual expenditures spent and entering the data into a cost control database. Cost codes are used to make it possible to compare real cost data with projected values. The industry employs a variety of cost code kinds. The first step in selecting a cost coding system is to ensure that all projects within the organisation utilise the same codes. This will allow real costs to be compared when a project is complete and fed into a functional estimating database. Along with file codes, subcontract and purchase order codes, as well as estimating and scheduling codes, the cost code system must to be uniform. A cost coding system could include components like the specification number, the task number specifically, and a designator for the costs of labour, materials, and subcontractors. RS Means cost codes, which are comparable to Construction Specifications Institute codes, are used by certain contractors. The general contractor may do project cost accounting either at the home office or out in the field, depending on the size of the construction company, the kind of work, the type of customer, and the contract agreement. Generally speaking, it is more probable that all accounting tasks will be carried out at the home office the smaller the firm and the lower the contract value. A worksite cost accountant may be a part of the project team on bigger assignments. The kind of contract and how it handles reimbursable expenses

may also have an impact on where the construction company does cost accounting. The next two cases are distinct.

Most accounting tasks on a project are the same, regardless of where the cost information is gathered and where the checks are written. The procedure starts with a revised estimate. After then, real expenditures are incurred, whether via direct labour, material purchases, or subcontract invoices. The time sheets and invoices include cost codes (those that match the estimate). Often, the cost engineer is where the process starts. After that, the project manager and superintendent get the coded time sheets and bills for approval. In projects with a cost-plus structure, the customer or the officer-in-charge may sometimes also wish to provide their first consent. The cost data is entered into the cost management system after the coding and approval of the time sheets and invoices. The proper coding of real costs is a crucial part of this cost recording process. The project team won't really know how they are doing on that particular piece of work if expenses are unintentionally or purposefully entered inaccurately. Some superintendents could instruct their cost engineers to purposefully code expenses against things where there is money left over rather than necessary against the right job activity, disguising overruns in the process. If there are coding mistakes, the workers on the worksite won't be able to monitor and fix the building procedures. For the project team to get an accurate accounting of expenses, all costs must be properly coded. The requirement for precise cost coding is shown by the following two instances.

The cost control process's biggest and longest step is cost recording. Project engineers and worksite cost accountants, if available, are often responsible for keeping track of real costs. The cost engineer is engaged in documenting expenses in a number of ways, including: a monthly projection for project management for the home office

The culture of the construction firm, the difficulty and scope of the project, the specifics of the contract, and the team members engaged all influence how independent a worksite project team is from the home office. In the hotel case study, the distance between the worksite and the home office was also quite important, particularly in terms of jobsite cost accounting. No matter what, there will always be feedback and direction from the corporate office to the workplace, as well as reporting responsibility from the jobsite to the CEO and CFO. As there is seldom a "perfect estimate," many construction projects won't go "exactly" as planned and scheduled, despite the best efforts of management. The project team will identify discrepancies that need attention and possible correction by continuously comparing actual costs reported against the estimate. The contractor cannot wait until the job is complete to determine if it was profi. There is nothing that can be done at that moment to resolve the issue. Many factors, such as the following, might cause costs to go over budget: After the source of the cost overrun is established, the worksite team may need to modify or revise the plan; preferably, the problem was identified in time to make a change. The following are some examples of corrective measures, or "fixes": Use different tools or methods, enforce subcontract agreements, prevent back-charging by subcontractors, change the personnel of the in-house general contractor, switch the subcontractors (this is challenging to do), change the client's order, etc. Boost the time, or

Judicious use of overtime - occasionally spending money might result in a savings.

A monthly project forecast that is communicated with the superintendent and the officer-in-charge must be created by the project manager. The project cost engineer, field foremen, and superintendents should all contribute to its preparation. The monthly prediction can also be of interest to the contractor's bonding and banking partners. If a negotiated cost-plus contract is in place, the customer may be copied on the monthly projection. All estimate regions, costs incurred so far, and the anticipated cost of completion are included in this forecast's line

items. Each of the main work categories is given its own prediction page, which is broken down for all job categories. As previously mentioned, the main components of the estimate are direct labour, material, equipment, subcontractors, and overall worksite circumstances. Via a series of mathematical calculations, the cost prediction is created. Compared to the initial estimate made before the project began, each calculation gives a more accurate projection of the costs at construction's end. The formatted forecast spreadsheet uses a simple set of Excel rows and columns. The following actions are taken during the development of the monthly project management cost forecast:

Start by referring to the initial or agreed-upon estimate. The amount at the bottom of this column must match the contract's initial value precisely. Only authorised modification orders are included in the following column. There is no assurance that modification orders that have not been accepted or ones that are still being processed will be included in the contract value. Columns three and four are added in the fifth column to determine the current contract value. Actual expenses as of this writing are shown in the sixth column, according to the monthly work cost history report. The hardest column is the one after that. The preceding columns were all just copied and pasted from other accounting reports and regular math computations, or they were sent. The project team must make an informed guess as to how much money is still remaining to be spent in the seventh column, which is designated as the "forecast" column. The forecast may be created in the following several ways: Just enter the amount that has been contracted but has not yet been spent so that each line item's total is accurate and there is a $0.00 variance at the end. By setting up the columns to automatically calculate the to-go fee, this may be accomplished. If the initial estimate was $2,500 and $2,200 has already been spent, for instance, $300 remains. Utilizing a trend analysis, the team would have $25,000 remaining to spend if they had used $500 per cubic yard (CY) of concrete for the first 1,000 CY and had 500 CY left. Math formulae may be used to easily produce this. Use the beginning production rate multiplied by the amount to be completed, presuming the initial rate was well-considered. If the rough framing was supposed to take 14 man hours (MH) per 1,000 board feet (MBF), but it has taken 16 MH/MBF on 80 MBF so far, then the initial productivity rate of 14 MH/MBF is multiplied by the remaining 20 MBF without taking the rate trend into account. Understanding the amount to go and estimating the productivity required to complete that task with feedback from the foremen and supervisor will allow you to calculate expenses to go with the greatest accuracy. Each line should be handled separately.

The first three of these strategies are simple to implement, yet they are all somewhat ineffective. Possible learning curve problems existed. Cost coding mistakes might occur. Conditions might have altered. Several forecasting techniques could be used to different line items and locales. Examples of each of these forecasting approaches, including situations where the estimate exceeds or falls short of expectations, for the installation of structural steel beams for the Olympic Hotel. The cost to date and cost to go columns are added to create the eighth column, which is the total prediction. The project team's estimate of the project's final cost, based on the most recent information available, is represented by the sum at the bottom of the total forecast column. This prognosis becomes steadily better with each passing month. A variance column is the final column. The approved and updated contract values are subtracted from the overall prediction. A positive number shows the contractor is coming in under budget and will strengthen its fee position; a negative number (typically in red) shows a forecasted cost overrun. By adding together all of the individual line item deviations from column nine, the forecast's final computation projects the contractor's charge. The project team is tasked by the home office with bringing in the price they first proposed, if not exceeding it. The forecast spreadsheet could have included two more columns between

columns three and four to include estimate correction journal entries and subcontractor buyouts; however, these columns were left out of this example for simplicity as the total number of journal entries would have been zero. The hotel case study project's monthly forecast summary page. Usually 10-20 pages long with hundreds of line items, the final prediction is just as lengthy as the initial comprehensive estimate. A work plan for sustaining or enhancing performance for the balance of the project should be included with the monthly forecast, along with a narrative outlining any no deviations from the prediction from the previous month. The financial reports must be consistent in order to provide the home office a clear picture of the project's progress and to give them reason to have faith in the worksite team. This is a crucial requirement of construction cost accounting. To assess and report the total project cost, the management team cannot afford to wait until the project is over. It's too late to take remedial action, and it's too late to pinpoint exactly why the team veered from the plan. An unduly pessimistic project manager provided the following example. In accordance with the procedures followed by the construction company and the demands of each given client or project, several different management reports may be produced by the worksite team or the accounting division in the home office. Standard cost accounting and financial management reports include the weekly labour report, monthly work cost history report, equipment log or ledger, and accounts payable report. Most reports are created by computers and are reliable to the extent that data on real expenses was entered appropriately. Weekly or monthly occurrences are possible, although The construction cost cycle consists of five steps: estimate setup, adjustment or correction, including buyout, cost recording after construction begins, system modification if necessary, and creation of the as-built estimate once the project is finished. Site supervision uses work packages to organise their tasks and perform cost management. The estimated cost in terms of direct labour hours and completion time must be provided to the foremen before they can begin preparing these. Access to appropriate building supplies and equipment is also necessary for work package execution. Cost cycles are followed by cost codes from beginning to end. The same cost codes should be shown on the estimate price recapitulation sheets, included in completed subcontracts, recorded on time sheets and material invoices, and entered back into the corporate database after the as-built estimate is finished. If the worksite financial team determines that they are falling short of their cost or schedule targets for whatever reason, they must investigate the problem and take prompt action to correct it. It can be required to alter the procedure, use other tools, or even replace the staff. It is too late to wait till the field receives financial reports produced by the home office. There is another another benefit of using work packages and doing as much cost accounting as is practical on the worksite. For the home office, the project manager creates a monthly cost and fee prediction report. This estimate for the project is virtually brand-new, taking into account both actual expenses and anticipated completion costs. The amount to go and learning curves must be taken into account while analysing each line item separately. The CEO and CFO will very certainly discuss project predictions with internal equity partners as well as external stakeholders like the bank and the guarantor, at least in brief form. So, when reporting building costs, consistency and correctness are crucial. While earned value is another cost management method that is often used in conjunction with the information presented here, the following is exclusively dedicated to that more complex subject.

Create a cost projection for the job tasks based on On the assumption that the following percentages are completed and spent, estimate the remaining hours required and determine the overall over- or underrun this project will accomplish. Use the wage rates from 18 or other local current rates to convert the hours to dollars. You may use whatever craft blend you see fit. Indicate what remedial steps should be performed and any potential causes of the overruns or underruns. Calculate the historical as-built unit man-hours if everything continues on its current course (proceeds at the same pace as it has been). Recall that direct construction

expenses are those that are incurred and linked to real construction activity, or those that can be physically seen and felt on the worksite. Concrete and structural steel installation are two examples of direct building expenses. Direct expenses are simple to track. Indirect expenses are those that are dispersed across business activities (in the case of a home office) or dispersed throughout worksite operations. The salary of the chief financial officer (CFO) and the rent of the office space are two examples of indirect expenses associated with working from home. The pay of the project manager (PM) and the trailer in which he or she works are two examples of worksite indirect expenses. Indirect expenditures associated with the jobsite and home office overhead are included in the charge for conducting construction work. It is also important to keep in mind the several general condition words, some of which are vastly different from one another and others which are identical.

The idea of activity-based costing has had difficulty distinguishing between fixed and variable overhead and sometimes regards all fixed expenses as variables. Applications for ABC should emphasise variable expenses for home offices. Separating general circumstances into those that are first "organizational"—those that exist whether the firm generates $1 million or $100 million in revenue—is a valid strategy. A concrete supervisor who helps project superintendent's plan their concrete pours and staffing requirements is an example of a "assignable" expense that may be linked to construction activities. Some academics and activity-based costing consultants want to convert all indirect costs, including those incurred at the work site and at the home office, into direct costs, however this is not practical. Certain overhead expenses, like the CFO's salary, must be spread throughout the company's operations. Other overhead expenses, like the superintendent's pickup vehicle, must be spread over all construction site activities. To determine the actual cost of each component of work, it is practical to assign as many variable expenses to direct work as feasible.

Activity-based cost accounting distinguishes between overhead charges that contribute value and those that offer no value, little value, or consume resources. Lean construction, which emphasises removing these low-value, resource-intensive expenditures, is comparable to ABC in this way. These differences might be discovered using an ABC workshop made specifically for a certain contractor. A formal partnership session is quite similar to how an ABC workshop is organised and run. Some participants could be reluctant to cooperate with the ABC process because they are concerned that by recording their actions, their productivity or lack of productivity would be revealed. At the workshop, this has to be discussed and handled right away. Considerations for the workshop include:

The ABC method' foundation is the identification of cost drivers and building cost items. Cost drivers are those unplanned, undirected operations that are best suited for project or direct work package allocation. Cost drivers must be quantifiable units that produce or drive the cost. There are three types of cost drivers: The relationship between an activity's cost and the cost object is the cost driver. The next stage is compiling a list of overhead items to research as well as a list of departments, positions, and cost codes to which to apply the overhead. As mentioned in earlier chapters, many contractors conceptualise their job in terms of assemblies, systems, or work packages. Field operations including concrete foundations, structural steel, and preliminary carpentry are examples of cost items, or assembles. There are many various methods to collect, classify, and arrange expenditures; in essence, there are no "laws," but there are certain general recommendations that should be followed. Six activities are too few and 1,000 are too many when categorising cost items using the activity-based costing approach. The tracking of expenses on a per-phone-call basis is excessive. The Pareto's 80-20 rule is applicable in this situation as it is in many other areas of cost accounting and financial management. While CSI specification divisions or sections may be used to allocate costs, assembling is a preferable use. An organisation and cost hierarchy or

tiers should be established by the contractor, comparable. Starting with corporate departments, various departmental projects, systems like site work, substructure, superstructure, finishes, and MEP (mechanical, electrical, and plumbing), and finally direct work assembly or by foremen or by subcontractors, would be the order in which this would happen.

Contractors may adapt to activity-based costing by, among other things, allocating home office staff members proportionately to the projects they are working on and refraining from uniformly allocating their time to overhead expenditures that are shared equally across all business activities. Together with salary, this also accounts for the proportions of office expenses, office supplies, and autos. The following are some instances of people and activities that may be proportioned:

Construction businesses with high overhead costs as a proportion of sales and/or high overhead components like marketing directors should pay the greatest attention to activity-based costing research. The ABC method is also best suited for businesses with several divisions and/or products since overhead may be allocated directly to each project or division as it is spent rather than being distributed based only on overall revenue percentage. The following two instances ABC and lean building methods were used routinely by general contractors.

It's crucial that the activity-based costing method does not spiral out of control and end up costing a business vital time and money. Tracking real expenses on an activity-by-activity basis is challenging, particularly for smaller or often changing activities. It may be challenging to accurately capture expenses, particularly for labour. A set of six or more tasks makes it simpler and nearly as dependable to estimate labour costs. Comparing home office labour expenses to building rent, copy machine leasing, or furniture prices is simpler. Department revenues and volume may be used to determine how much money per square foot of floor space is given for facility expenditures. As labour expenses are the most unpredicted, ABC processes may use them the most. Assume, for instance, that the estimator spent 30% of her time on lump sum bid estimates, 60% on negotiated offers, and 10% on upkeep of the estimating database, training, and staying current with new technologies. This approach has some subjectivity, but it is still more "activity-based" than just distributing expenses across revenues. As the following example demonstrates, certain indirect expenses are simple to apply. The same approach is used for internal project managers and superintendents who are underperforming or inexperienced and who need more help from the home office than other employees. As discussed throughout this book, various construction sectors, such as commercial, residential, and civil construction, have quite varied methods to estimating, cost accounting, and financial management. Moreover, there are no standards for cost distribution, cost coding, or cost management among general contractors or specialist contractors. Projects with a cost-plus component, a guaranteed maximum price, and lump sum payments are all handled differently. Researchers find it challenging to study and apply their findings on novel concepts like activity-based costing because of these and other fragmentations in the construction industry.

Applications for jobsite activity-based costing

The primary focus of ABC is not on direct construction activities, which are tasks that a contractor performs on their own and for which costs can be estimated fairly accurately and recorded with ease. The ABC process can be used with a variety of building materials. For instance, the superintendent works with the jobsite cost engineer to purchase a sling of 100 sheets of plywood. The plywood itself doesn't have a specific cost code, but this sling can be used for a variety of things, including concrete forms, site fencing, wall and floor sheeting,

safety signs, a plan in the office trailer, and more. Another illustration would be five redi-mix concrete trucks, each carrying nine cubic yards of concrete, and all having the same design mix of 3,000 psi (pounds per square inch). There are footings, sidewalks, and retaining walls included in this 45 CY pour day. CY should be used to allocate the cost of the concrete to each of those individual work assemblies.

It is challenging for general contractors to allocate overhead costs to direct work because they typically subcontract 80–90% of the work. It will be challenging for a pure construction manager to apply activity-based costing to direct construction cost activities if they exclusively employ subcontractors, which is occasionally a contract requirement. A GC's management resources are increased when a subcontractor performs poorly. This confirms the necessity of using "best-value" subcontractors, which is a topic covered throughout this book. In this instance, ABC permits use of home office overhead for projects but not for managing work activities. Some jobsite general conditions or indirect construction costs that are based on a percentage of volume may be applicable to the ABC methodology. The 5 section titled "Jobsite general conditions" described these costs. The expanded eResource estimate template has one line item that adds 15% to all equipment rentals for fuel, oil, and maintenance. However, this line item is not allocated to any specific piece of equipment or to the task that it is helping with. Another illustration would be temporary power consumption, which can be significant for projects using a tower crane for hoisting, as opposed to projects using a crawler crane or boom truck for steel or carpentry, which would charge the diesel fuel directly to the work assembly rather than the budget for jobsite general conditions. Both of these examples do not apply to ABC.

Using lean construction methods

The goal of lean construction techniques is to eliminate construction waste while still meeting or exceeding the project owner's expectations. Utilizing lean principles leads to better use of resources, particularly labour and materials. The goal of the lean supply strategy is to reduce variation, eliminate waste, enhance workflow, and strengthen trade coordination by providing materials as needed. The task of the jobsite project team is to develop a realistic construction flow that takes into account the GC's (general contractor) and subcontractors' reliance on material suppliers. The timing of material deliveries is then planned so that they show up on site just in time for the project's installation. Although a construction project's detailed contract schedule is not replaced by lean construction, it does use short interval planning and control that enhances the timely completion of construction tasks. The increased use of off-site construction or prefabrication of building components is another aspect of lean construction. As a result, time is saved, material waste is decreased, on-site safety is increased, and installation quality is improved. Less fabrication on the project site allows workers to focus on installing material fabrications rather than creating construction components. Top-down support from the project owner, general contractor, and architect teams, all the way down to design engineers and jobsite construction management, as well as subcontractors and foremen, is necessary for a company or project to accept and incorporate lean.

Lean construction implementation follows logically from activity-based costing (ABC) and other cost control strategies like work packages and earned value discussed in earlier chapters. Similar to ABC, lean construction has been the subject of numerous academic studies and by Ballard, Howell, Kim, and others. This also discusses other cutting-edge cost-saving and cost-reduction strategies in addition to lean techniques. This includes value engineering (VE), subcontractor and supplier impacts, supply chain material management, jobsite laydown and material handling, just-in-time (JIT) planning, last planner, pull

planning, and target value design. Since many of them are direct extensions of lean, such as JIT, last planner, and pull planning, this has combined all of these more advanced cost control topics into a single discussion.

Lean construction is best described as a body of research leading to a philosophy of advanced cost control methods planning and implementation rather than by a single, precise definition. There are numerous thin topics mixed in. To accept a lean philosophy, contractors do not have to adhere to all of these principles; in fact, some contend that some of these ideas do not strictly apply to lean. However, if "eliminate waste" is the ultimate objective and is broadly defined, then all of these fall under the lean category along with other cutting-edge cost control concepts; in essence, there is no limit. According to the website of the Lean Construction Institute, lean "improves value on projects and reveals wasted resources like time, movement, and human potential" (www.leanconstruction.org).

Lean has been applied to construction from production industries like the automobile industry, specifically from Toyota, just like activity-based costing and other cost control topics. Lean manufacturing has as its guiding principles minimizing waste, eliminating any inefficiency such as an excess of inventory, increasing labour productivity, and creating happy customers. Lean creates value, so anything that doesn't contribute must be eliminated. Total quality management, which causes rework as a result of poor quality in any area of design or construction, has an impact on lean. In an effort to cut costs, speeding up design or construction can actually result in waste, more defects, and higher costs.

The saying "time is money" is not always accurate. Since design is the first step in the construction process, enhancing design operations forms the basis of many lean cost-saving ideas. Lean construction is a well-known phrase, but it could also refer to lean design or even lean built environment. Pull planning and just-in-time are examples of lean concepts that are processes rather than tools. By reducing waste, lean maximizes value. Lean is not something that happens by accident; rather, it requires a formal process and adoption by the entire team in order to be successful. Lean processes also require a top-down commitment from project owners or clients as well as owners of design and construction firms.

Repetitive teams for design, construction, and project ownership are advantageous in the lean process. If they have collaborated before, they are aware of what to anticipate from one another. The projects that use integrated project delivery (IPD), in which all three parties share the same risks and sign the same contract, are complicated and are best suited for lean. enhances lean success, which in turn enhances IPD success. The cost savings topics covered in this would be best implemented using design-build or construction manager-at-risk, also known as CM/GC, delivery methods if IPD is not the project owner's preferred delivery method. Additionally, negotiated projects are a better fit for lean than bid projects.

Lean and activity-based costing are two new ideas that the construction industry typically rejects as being too production-oriented. The following example demonstrates how construction contractors, along with their tried-and-true methods and means, are slow to adapt. On the job site, it is common to hear the phrase "if it isn’t broke, don't fix it." As was covered in earlier chapters, the construction industry differs from other industries. Some claim that the issue with contractors is their meticulous attention to separate tasks, budgets, and timelines. It is preferable to concentrate on overall objectives and how various activities interact. Additionally, subcontractors fragment cost analyses, which makes it more challenging for contractors to adopt lean. Although many leaders in the construction industry are open to improving their procedures and have implemented many of the methods covered here. The target value design, just-in-time deliveries, last planner, pull planning, and supply chain material management are discussed in the sections that follow. All of these ideas and

procedures are components of lean building. The process of documenting actual cost outcomes after putting lean construction improvements into practice is known as "lean accounting," which is synonymous with lean construction.

CHAPTER 7
TARGET VALUE DESIGN

[1]Dr. Mansi Kukreja, [2]R Thanga Kumar
[1]Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.mansi_kukreja@cms.ac.in, [2]thanga@cms.ac.in

Lean construction is a subset of target value design (TVD). TVD, also known as target value costing, has its roots in manufacturing, namely the car sector. TVD works well with negotiated and design-build projects, much like lean. The design team is entrusted with designing within the constraints of the project owner's budget. The many design disciplines share the budget in the manner of pie slices. To ensure that the project as a whole stays within the owner's budget, each design package must be financially feasible for its portion of the pie. This procedure either presume that the designers have internal estimating resources, engages an outside estimating consultant, or contracts a construction manager in advance. Early on in the design development process, several essential subcontractors may need to be added to the team, including those that specialize in mechanical, electrical, and plumbing (MEP), precast concrete, curtain walls, landscaping, elevators, and other areas. The difficulty in obtaining competitive bid price as a result of this procedure renders TVD sometimes impractical, particularly for public works bid projects.

The design and construction team's first goal is the owner's happiness, particularly if the owner is cost-conscious. Instead of waiting until bids are received, the design team must consider cost while making design choices. The project must be revised if the budget is over, often with help from value engineering. The "final" cost must be the design parameter, which is often different from the bid or contractual cost. Active management of owner contingency logs and value-added logs, which are comparable to a subcontract buyout log or VE log, is part of the target value design process. Typically, a target value design project begins with a workshop where everyone on the team buys into the idea. All of the participants, including the project owner, architect, and general contractor, as well as the design engineers and significant subcontractors, must work together very closely. The estimate is created top-down, which is the reverse of how most estimators operate in the construction industry. They often start with a more specific emphasis, such as quantity take-offs and pricing recaps, then summaries as they approach the final price, as previously shown in 4.1. In this respect, TVD is comparable to pull planning, which will be covered later and in which the goal is established and the plan is created backwards. Whenever a project component, like structural steel, goes over budget, money must be transferred from another system, like electrical, to make up the difference. Similar to many other lean principles, TVD and building information modelling go hand in hand. Early contractor-generated estimates may benefit from fourth- and fifth-dimension modelling.

Yet target value design has certain flaws. There is no assurance that costs will correspond when contractor bids are requested, even if all of the budget pie pieces could first fit together. Contractors are often asked to provide comprehensive schedules of values with their bids and proposals by project owners. Yet, contractors have been known to priorities one part of the estimate over another because of the possibility of modification orders or because of front-loading tactics for early pay request line items. TVD does not take into account economic

developments that may have an influence on pricing, such as the rise in the cost of copper wire and pipe. Most construction projects also include change orders, which the owner's budget has to account for. It is believed that design-build and CM/GC project deliveries have less change orders than conventional lump sum bid projects, making them better fits for the TVD model. A happy owner wants the design to reflect the actual cost, not only the budget or even the bid price. The owner is at risk if the project uses a cost-plus pricing strategy with no assurance of the final cost. While the project's original budget and bid may have met the goal, the final price could not have.

Just-in-time deliveries

Construction material supplies made just-in-time have been adopted from JIT manufacturing. The intention is to have the necessary items on place within 36 hours after installation, but not too early or too late. The balance between having just enough and too much material is achieved by the contractors. JIT does not work as well for remote projects like the Olympic Hotel case study as it would for an urban tower. Large construction sites may not be handled efficiently since the supplies may be dispersed too far from the location of installation. Long-term storage of an excessive amount of stuff exposes it to weather deterioration and theft risk. As will be covered later in this chapter, one of the major sources of labour inefficiency is the double handling of material. Nevertheless, preventing suppliers from delivering too quickly has the drawback of assuming the fabricator has space in their storage yard (and is thus not lean) and can be secured and kept out of the elements. Additional issues might arise if the fabricator sells the materials for your project to a different general contractor who wants them sooner or is ready to pay more, and the supplier chooses the material that is the simplest to transport or sell.

final planner

Planning is labor-intensive; it is foresight scheduling. The term "the final planner" refers to the person or group in charge of completing the task. On the construction side, this comprises the carpenter and electrician foremen, and on the designers' side, it includes the structural and electrical engineers. The final planner is not always the chief architect. Like general contractors, project owners, and subcontractors, the majority of architectural firms also use project managers (PMs). If at all feasible, the last planner notion should be shared with the project engineers (PEs), cost engineers, and worksite cost accountants at the bottom of the organisational ladder.

A lot of general contractors create top-down times and tell subcontractors when to accomplish their job. A cooperative time developed with input from subcontractors—not the marketing salesforce, but foremen and superintendents—is far more realistic. When a GC's proposed project supervisor helps with estimate development, it might be advantageous in the same way. The superintendents listed below did not use the last planner's lean building methodology.

Pull scheduling

Lean construction often adopts pull planning or pull methodologies from the industrial sectors. The individuals who pull are the ones who employ the results and would be regarded as the already described "last planners." Another option is to start the process with a workshop and facilitator. Subcontractors should also be included as stakeholders. Pull planning begins with the work that needs to be done and plans backward to achieve the objective, similar to target value design, which starts with the entire budget and works forward. Each designer and contractor receives a set of coloured sticky notes to indicate their delivery deadlines, commitments, and the steps necessary to meet those deadlines. Similar to

how each subcontractor would create a three-week look-ahead calendar for the weekly foremen's meeting and then share those schedules with the other firms, this would be done. But, in this instance, every company works together to create a single time. Here is a picture of the Olympic Hotel and Resort projects pull planning time. Devotees of lean construction believe that contractors shouldn't overbook themselves. It's fine to slightly underload since it allows for process changes, if required. Contrarily, a lot of builders would contend that teams should be assigned somewhat more work than they can do in a week, not less. Some contractors believe it is preferable to hire a superintendent or supervisor who is somewhat underqualified to carry out his or her tasks but is ambitious and eager to work hard and learn. According to this theory, an underload of labour is preferable than a minor overload. Pull planning aims to get everyone on board cooperatively while also working to eliminate any obstacles in the way of completing the task, leaving nothing for the last planners to do but finish the job. Significant groups of possible restrictions include the following:

Engineering value

Several people who work in the built environment, notably certain designers, believe that value engineering cheapens the project's design, yet this is not the case. In order to fulfil the same function as the original components at a reduced life-cycle cost without sacrificing reliability, performance, or maintainability, VE entails examining a few key construction components. VE studies may be carried out by consultants during the design development process, as a pre-construction service provided by the contractor, or by the contractor themselves during construction. Such investigations are most productively carried out when the design is being developed. Target value design, as previously mentioned, must occur before to design; on the other hand, value engineering (VE), on the other hand, often occurs either during the design process or after design. Some people do not consider the typical lump sum delivery procedure of design-estimate-VE-redesign to be a lean construction subject since it wastes time and incurs extra design costs.

Value engineering analyses are often carried out in the preconstruction stage of planning. The goal of the procedure is to choose the design elements or systems with the greatest value. To determine the potential for value improvement, the fundamental functions of each component or system are examined. The VE study team must comprehend the designer's reasoning behind the design development as well as the presumptions made while creating design criteria and choosing materials and equipment. The goal of VE is to create a list of potential substitute components or materials. The alternatives and the under consideration design elements are functionally compared, and preliminary cost data is created. The goal is to identify the alternatives that will satisfy the owner's needs and add value to the finished project. Before being presented to the project owner, life-cycle cost data for each VE choice is often examined.

Value engineering ideas are created by first analysing the benefits and drawbacks of each choice, after which the ones that provide the greatest value are chosen and presented to the designer and owner. The VE proposal includes all specific pricing, markups, and supporting documentation, making it very comparable to a post-contract change order proposal. Similar to a change order proposal, the proposal should contain all cost data created by the VE team. Similar to other cost control or equipment monitoring logs kept by the construction team, each VE proposal is recorded in a log.

The owner and designer are consulted before approving the plans. VE suggestions should be included in the contract agreements if they are accepted. When the construction contract has been awarded, VE ideas that have been authorised must be integrated into the contract via a modification order.

Suppliers and contractors

Nowadays, 80% to 90% of the building project is subcontracted by a typical commercial general contractor. Subcontractors, also known as specialised contractors, are crucial contributors to the success or failure of the general contractor (GC) and are an integral part of the project delivery team. Subcontractors need to be carefully chosen and controlled since they have such a big influence on a project's overall performance in terms of quality, cost, schedule, and safety. The GC and the subcontractors must respect and trust one another in order for the project to be successful since neither can succeed alone. As a result, it is advantageous for project managers and superintendents to establish strong, long-lasting relationships with dependable subcontractors. Subcontractors must be treated equitably by PMs and superintendents in order for them to finish this project on time and be able to submit competitive bids for further work in the future.

The general contractor's employment of subcontractors is a risk management strategy. The GC may obtain specialist trained artisans and equipment via subcontractors that they might not have on-staff. Accurately predicting the quantity and cost of labour needed to complete a project is one of the biggest risks in contracting. The GC may shift a large portion of the cost risk to subcontractors by subcontracting substantial portions of the job.

The risk of accurately predicting the expenses for labour, materials, and equipment rests with the subcontractor when the project manager requests a quotation from them to complete that scope of work. It is costly to engage craftspeople skilled in the several specialised professions needed for large building projects, and they are often only employed on a project site for short periods of time. A GC could not afford to hire all varieties of experienced tradespeople as part of its own full-time workforce.

While subcontracting reduces risk, it does not completely remove it. While dealing with subcontractors, the project manager and superintendent cede some degree of authority. The duties of each subcontractor are specified by the subcontract's terms and scope. The general contractor is still in charge of making sure that the contract's criteria are met even if portion of the work is accidentally left out. Just those tasks that are mentioned in detail in the subcontract agreements for specialty contractors are needed to be completed. Using subcontractors may make it harder to maintain consistent quality control, as several of the examples in this book demonstrate. Project owners hold the general contractor's superintendent and project manager responsible for the quality of all work, whether it is done by the GC's direct crews or by subcontractors. Another problematic element of subcontracting is subcontractor bankruptcy, which may be reduced by thorough prequalification processes and prompt payment for subcontract work. Since the subcontractor's craftsmen could be transferred from the GC's project to other projects, scheduling subcontractor work is often more challenging than arranging the crews of the GC. Many GC superintendents believe that subcontractors' safety protocols and practises are less successful than those followed by the GC's own workforce. When subcontractors additionally assign some of their work to third-tier subcontractors and suppliers, all of these financial and control considerations become much more critical. To ensure that the project manager and superintendent are able to deliver a high-quality project on schedule, safely, and within budget, it is crucial that the general contractor chooses excellent "best-value" subcontractors. PMs must keep in mind that subcontractor performance will have an adverse effect on their ability to land future contracts and their professional reputations. After the selection of the subcontractors, contract agreements stipulating the terms and conditions of the agreement as well as the job scopes are signed. A unique number will be assigned to each subcontract and supplier purchase order.

Management of the material supply chain

Several case studies from lean construction research use the unusual assumption that the supplier of materials is also the general contractor. As was previously said, GCs largely depend on the assistance of subcontractors and suppliers to complete a project effectively. All building supplies are supplied by vendors. The supplier is in charge of cost management at the fabrication plant. The GC must outsource as much of the manufacture and assembly of materials now done on-site to suppliers, particularly local ones, in order to effectively manage the supply chain. Supply chain material management moves the cost control emphasis as early as possible in a construction project from the usual cost control focus of a contractor's direct worksite field labour to design and material manufacture.

Prefabrication off-site

Lean construction's primary tenet of eliminating or limiting waste in the construction process is achieved through prefabricating building materials. Off-site prefabrication of materials increases quality control because the materials are constructed and stored out of the elements, makes in-process inspections easier, increases safety in a controlled environment, lowers costs because many construction materials are now manufactured based on products rather than projects, and increases schedule adherence because many tasks can be completed concurrently rather than sequentially. The design team may specify materials as "bought" rather than "field-assembled" items, but a general contractor may often compare the benefits of shop fabrication and field assembly as part of their preconstruction planning for means and procedures. There are several of prefabrication businesses and assembly yards that focus on assembling and selling building supplies.

Purchasing local resources

Local building material purchases are not only cost-effective and sustainable, but they also provide superior quality and schedule management. A general contractor may simply visit the warehouse or yard to see progress if they choose vendors that fabricate products nearby. As is the case with the manufacturing of structural steel, outside inspectors may also visit the shop to check and test things. Less fuel will be used in the transportation of materials if they are bought and/or manufactured locally, say within 100 miles of the project location.

Laydown on the job site and material handling

To ensure the success of the building project, the worksite must be well organised. The arrangement of the worksite has an impact on the general contractor's and the subcontractors' costs for labour, material handling, and the usage of large equipment. The efficiency of the whole project team as well as their safety are both enhanced by a neat and ordered site. Locations for temporary buildings, material handling equipment, material storage, and material transportation should be included in the worksite layout design. The following example illustrates how ignoring this might have a negative impact on production, safety, and cleanliness. For a plan to be successful, particularly on downtown high-rise buildings, the appropriate selection of tower crane types and placements is important. Fortunately, the 10 acres of the Olympic Hotel and Resort project's location provided ample of laydown space and access for mobile cranes. The superintendent of the general contractor (GC) should create the site layout plan, taking into account not only the demands of the GC's direct work but also those of all subcontractors working on the project.

While creating the worksite layout design, the superintendent should take into account all site restrictions, equipment limitations, jobsite productivity, material handling, and safety concerns. The jobsite design should also take into account the flow of traffic into and out of the site, as well as the positioning of site offices that are handy for visitor control. The site

logistics plan has many objectives, including preventing duplicate handling of supplies, which is a lean productivity factor, protecting items from the elements and theft, and keeping materials near to the work area without being too close so that the craftsmen trip over them. As was previously said, they are all just-in-time lean factors. The jobsite layout design is an excellent proposal, interview, and marketing tool in addition to being a productivity tool. It demonstrates to the project owner that the contractor has given the job some consideration and has added a personal touch. For a closely contested award decision with a negotiated project, it may matter. The Olympic Hotel and Resort's worksite layout plan is shown on the eResource.

Use and depreciation of equipment

We spoke with contractors and accounting firms as well as other construction accounting books while deciding which subjects to address in this book. Depreciation has long been a crucial component of the cost accounting concept. Depreciation is the term used to describe the deterioration of fixed assets like real estate, machinery used in construction, and office furniture. Depreciation is a significant tool for investors and organisations to lower taxes, and this is particularly true for construction firms that own equipment. Nevertheless, monitoring and assigning depreciation is more of a chief financial officer (CFO) and home office accounting function, not necessarily a project manager's job. Depreciation accounting on the equipment ledger has often been handled by the home office accounting department, not the worksite project management team, similar to other markups on the bottom of the estimate summary, such as fees and insurance and labour load. Internal accounting journal entries are often used to do this. The accounting department may produce an invoice and transmit it to the worksite so that the project manager (PM) may cost code and approve the rental fees if construction businesses, as opposed to equipment companies, own their own equipment. Depreciation appears as an expenditure on the financial accounts, but it is merely a paper item and does not result in a decrease in cost. The goal of this book has been to link home office accounting to other financial duties carried out by the team members at the worksite, including the project manager and the jobsite cost accountant. The subject of construction equipment depreciation is consequently expanded in this to incorporate other associated worksite project management ideas in addition to defining different kinds of construction equipment and their ownership arrangements, whether internal or external. The project management team will need to organise and handle equipment purchase order contracts with equipment businesses if the equipment is owned by a third party in order to secure rental. Every construction equipment that is owned internally should ideally be job costed and not just sitting in the contractor's storage yard. To promote worksite productivity, equipment that requires maintenance has to be serviced right away, and the expense of those repairs needs to be allocated where it belongs. In earlier chapters, estimation and cost coding for rental and maintenance of construction equipment were covered. The Federal Revenue Agency (IRS) sets the accounting standards for depreciation in relation to corporate income taxes, more specifically the allowance for tax deductions. Due to the complexity of taxes and depreciation, the contractor will need professional accounting assistance, maybe with the aid of an outside certified public accountant (CPA).

Apparatus ownership

The construction business may own any of these categories of equipment, and the majority of talks on construction equipment accounting and depreciation centre on domestically held equipment. Nevertheless, relatively few construction firms really possess any machinery. Large heavy-civil contractors and maritime contractors can be an exemption. Compared to commercial and residential contractors, who depend on direct labour and the use of

subcontractors, they rely on a much higher proportion of specialised self-operated equipment for their building activities. Whereas civil and maritime work requires 50% or higher equipment expenses, commercial and residential building need 80% or more subcontract costs. The majority of industrial, institutional, and residential contractors either create separate equipment businesses or rent from third parties. Subcontractors' responsibilities and the extent of their work may include providing and operating equipment. Each of these configurations has positives and negatives.

Internal ownership

When it's feasible, contractors that own and run their own construction equipment want to keep that equipment occupied on project sites. When a piece of equipment is purchased, it will appear on the contractor's balance sheet both as an asset equal to its book value and as a liability equal to the loan sum owing to the bank. The obligation will decrease as the loan is eventually repaid, and the amount of depreciation will also decrease the asset's value on the balance sheet. These contractors utilise a lot of leverage and borrow money over lengthy periods of time with high monthly payments in order to buy equipment. The last of this book will cover construction firm loans in more detail. Loan payments must still be given to the bank even if the equipment is stored in the contractor's storage yard and not in use. As the equipment continues to deteriorate and lose value, the company balance sheet will be adjusted to reflect these reductions in value. The balance sheet and income statement of the contractor will be impacted by the sale of an item of equipment that is internally owned. If the equipment is being used, maintenance and repair expenses will be deducted from tasks; otherwise, they will be added to home office overhead. The corporate CFO often uses internal journal entries to handle the accounting for this kind of equipment. Owners of equipment must maintain it in use or face significant financial risk. In contrast, contractors could decide to buy their own equipment if they have special needs and don't want to depend on rental rates and equipment availability from outside third-party supply companies. When bidding on projects that primarily rely on equipment, including civil and marine construction, contractors that own their own equipment may be able to lower their own internal leasing costs.

Construction equipment manufacturers

Internally owned vs independent contractor equipment firms may seem to customers and even many on the contractor's team to be similar, but they vary greatly in terms of accounting and risk management. Many building businesses choose not to own their own equipment, instead establishing independent equipment companies or divisions that do. These distinct businesses will have a different name from the construction firm and will be established as limited liability organisations (LLCs). These businesses are often owned by a small number of people who work for the construction firm, frequently the corporate officers. For instance, the board of directors of Evergreen Construction Company (ECC) is made up of five executive officers (BOD). These five officers are the vice president of marketing, chief financial officer, chief operating officer, and chief human resources officer. These five people set up a different LLC that would own and lend out equipment to their own construction business, ECC. Their business was called Main Street Equipment, LLC. They are consequently renting themselves the equipment. They charge the construction business rent in a manner similar to how an outside equipment provider would charge rent. The construction firm is financially protected since they hired the equipment from Main Street in the event that there is ever an issue, such as a market downturn or a safety mishap that can be linked to a piece of equipment or operation. Due to the creation of a distinct LLC, the corporate officers are also personally shielded. The LLC may file for bankruptcy or claim a loss on their income statement, protecting both the construction firm and the equity owners individually from legal

action or financial loss. The financial distinction between the construction firm and the equipment division that the contractors will represent is not visible to seasoned project owners who use open-book contracts, such as the AIA A102. They often consider any equipment provided by the contractor to be internal property and work to safeguard themselves against inflated equipment leasing or maintenance expenses.

Excluding ownership

From the standpoint of a project manager, renting equipment from external third-party providers that own and rent construction equipment as their primary source of business is the simplest way. This equipment must be in great working order when it is delivered to the project and must stay so throughout the duration of construction. Equipment failures have a significant impact on the worker productivity at construction sites. Contractors may negotiate rental prices and terms and get bids from other suppliers. On the other hand, the PM is unable to make a deal with the BOD of his or her own construction business over the renting of a forklift. For the renting or leasing of machinery without an operator included, the contractor will engage into a purchase order arrangement. Included is a sample rental purchase order for a forklift. The worksite team should create a subcontract agreement rather than a purchase order if equipment is leased with an operator. The subcontract agreement permits general liability insurance to be provided by any business providing workers on the project. The management of cost-effective rental durations is a key component of equipment rental. Again, external rental providers make this simpler to manage than internal owned equipment. Mobilization or delivery fees as well as demo- bilization or pickup fees are often added to equipment rentals. The frequent rotation of the same piece of equipment on and off the project might result in significant expenses. To guarantee effective equipment utilisation, the superintendent should collaborate closely with the cost engineer or worksite accountant.

Ownership of Subcontractors

The most economical approach for a general contractor (GC) to have equipment on the project is to compel all of its subcontractors to provide their own equipment and not rent any equipment at all, either internally or externally. A GC may be able to avoid supplying any equipment, or at least minimal equipment, if they act more like a construction manager (CM) and give little to no direct work. The CM will still provide the on-site crew a trailer, a pickup vehicle for their supervisor, office furniture, office supplies, maybe a tower crane, a personnel and material hoist, and most likely a forklift. Yet, the less the GC or CM has to worry about equipment idle time, maintenance and repairs, or mobilisation expenses, the more equipment will be supplied by subcontractors.

Operation of equipment

While robots now play a bigger part in building, they are not yet running large pieces of machinery. Important components of construction cost accounting and risk management include who operates the equipment, how it is contracted, and under what conditions. There are several approaches to handling equipment functioning. The equipment alternatives for self-operation, subcontractor-operated and supplied, subcontractor-operated and provided, and owner-operator are briefly discussed in this section.

Self-operated

Contractors that own their own equipment—whether via a separate but internally owned equipment firm or as a component of the construction company—are likely to operate it with their own personnel. This gives the contractor the peace of mind that they are familiar with the machine operator, are aware of his or her skills, and know that the people in question are devoted to the construction company. The operator will be paid by the contractor in the same

way as any other worker in a construction trade. The foreman will fill out a time sheet, which will be cost-coded later in the section on "Equipment allocation to job cost" to either the equipment code they are operating or the task they are doing. Moreover, the employee's labour load will be calculated and added to the work. Operating engineers (OEs), who are members of a unionised trade, operate the equipment. The fact that surveyors are also OE union members is an intriguing tidbit. Merit shop or open shop contractors have the option of using regular workers or construction foremen to run equipment without of having to hire OEs. But, in order to operate the equipment they are employing, operators often need to be certified or licenced. On a construction site, everyone can run the pickup truck, but not everyone can operate the tower crane or the forklift. The author's son, an associate commercial construction supervisor and certified forklift operator, sometimes assists with this and spends a few hours each day looking for items in his pickup truck.

Rented and used a contractor

If the contractor rents the equipment from an outside vendor, they may either run it themselves, as was already mentioned, or they can hire a different contractor to do so. The contractor may not have an experienced or available OE on staff and may not want to take the danger of hiring an operator off the street in the case of huge equipment like a tower crane. Equipment rental firms provide a variety of services, including renting out equipment to general contractors with operators (which requires a subcontract agreement), renting out the equipment bare (which necessitates a purchase order), and providing the operator solely (also requir- ing a subcontract agreement). The GC will pay a loaded wage rate, which will include the OE's direct wages, labour burden, profit, overhead, and other markups, if they subcontract out the operation of the equipment exclusively. The subcontractor's company that is supplying the OE will handle the distribution of salaries and payment of labour taxes like social security. Certain machinery, like a big crawler crane, could also need two operators. The crane's cab is occupied by one operator, while the other is tending to maintenance. While moving from one project to another, this second OE, known as the "oiler," may also operate the crane. Tower cranes will need a separate "rigger," who may be hired internally or via subcontracting. Since they are often knowledgeable about crane operation, lifting, and related safety problems, riggers are frequently members of the ironworkers union.

The subcontractor delivered

When subcontractors provide their own equipment, the general contractor won't need to worry about the choice of equipment operators. An example of this is an earthwork subcontractor who, as was said previously, owns and uses a range of heavy-civil equipment, such as excavators and dozers. The subcontractor is in charge of selecting competent workers and managing their salary payments and labour burden obligations. The costs associated with equipment licencing and maintenance fall within the purview of the subcontractor. The general contractor will continue to guarantee that the subcontractor is using only trained equipment operators. Copies of operator licenses and certifications will be provided to the general contractor (GC) as either a component of the subcontractor's project-specific safety plan or as a separate submission.

Owner-operators

A single person owns and manages a lot of separate pieces of equipment. This often occurs with a variety of earthmoving tools, such as backhoes, track hoes, and dump trucks. Owner-operators operate a significant portion of long-haul semi-trucks. The equipment owner will then get an hourly (or weekly or monthly) charge from the general contractor that includes the rental of the equipment, the owner's salaries, the cost of any required labour, and markups

for things like insurance, fees, overhead, and licensing. This loaded rental rate will also include the price of required upkeep and repairs. For a GC who works with an owner-operator, it's like doing all of your shopping in one place.

Allocating equipment to work costs

A portion of the revenue equation that states that charge equals overhead and profit was reaffirmed in earlier general conditions chapters. The cost of the work includes jobsite overhead. The cost of running a home office is included in the charge (HOOH). If the charge is fixed, any decrease in HOOH will boost profits, whereas any rise in HOOH decreases profits. The project teams will be reminded by construction company leaders of the necessity to provide an accept charge, if not improve upon it. For controlling HOOH and increasing profits, the distribution of equipment expenditures, including leasing, operation, and maintenance, is crucial. The construction business essentially wants all equipment to be job-costed and not idle in the storage yard or undergoing maintenance while not being used on a building project. The following is a description of several tactics or ideas to prevent equipment expenses from eroding profits. Several of these are uses for activity-based pricing, which was previously described.

Renting equipment should be moved from HOOH to project overhead. Transfer the cost of renting equipment from worksite overhead to the task itself; this converts the cost from an indirect to a direct expenditure. A mobile crane and welding machine are two examples of equipment that should be charged to the construction of structural steel. Demand that subcontractors provide their own tools, such as cranes for lifting objects to the roof and forklifts for unloading materials. Reduce self-perform work and increase subcontracting, which will reduce the requirement for leased and operated equipment. Particularly on negotiated contracts where equipment maintenance may be a work expense, charge all owned-equipment maintenance to the job and not the home office. In all purchase orders or subcontract agreements for rental equipment, maintenance obligation provisions should be included.

To monitor the equipment on the project, the superintendent, cost engineer, and worksite accountant will need to collaborate closely. They will use a variety of project management technologies to do this. The CFO will keep track of the construction company's internally owned equipment on its equipment ledger, which also includes rent, maintenance, and depreciation allowances. The equipment ledger and other financial statements were presented. A simple Excel spreadsheet will be used on the worksite by the construction crew as an equipment log, listing each piece of equipment along with its source, cost code, arrival date, departure date, and maybe any remarks related to operation and maintenance.

The superintendent's journal is another piece of paper that all general contractors and the majority of subcontractors utilise. This is also referred to as a daily report, log, or journal, and the project superintendent should write it. For each day working, it captures a range of real-time details regarding the project's activities. The supervisor writes in the journal at the conclusion of each workday.

The journal is crucial for keeping track of borrowed equipment. Because the superintendent's diary is authentic, it is also reviewed when there is a disagreement with a supplier or subcontractor regarding manpower, equipment deliveries, equipment problems, and equipment demobilization. The cost engineer records what equipment is on site and what it is working on in the equipment log.

Externally hired equipment is recorded quite similarly to construction supplies. The worksite accountant receives monthly bills, cost codes them, and submits them to the main office for

payment. Equipment time sheets are supplied to the worksite for cost coding by the project financial team, or the main office may utilise journal entries to fully account for internally owned equipment. Similar to building materials, renting equipment is not subject to retention by the supplier's general contractor.

CHAPTER 8
EQUIPMENT REVENUE AND COST DEPRECIATION

[1]Dr. Avijit Bakshi, [2]Umakanth S
[1]Assistant Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Professor and Hod, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.avijitbakshi@cms.ac.in, [2]umakanth@cms.ac.in

The reality is that construction equipment sometimes has to be repaired and requires frequent upkeep. These expenses, which may be significant, are often not expected or provided for in a contractor's estimate. There was a line item for equipment maintenance in the comprehensive general conditions estimate for the hotel case study project on the eResource, but only a little cost allowance had been included. The financial ramifications on construction production while the equipment is stopped down are even more costly than maintenance. Consider working on a 40-story building for a week without access to the tower crane or the material and people hoist. The best way a contractor can control these costs is to only rent equipment that is in excellent condition, demand that the supplier perform routine maintenance and pay for all repair costs, and include a provision in the purchase order requiring the supplier to have a backup machine available in case there is a complete breakdown and replacement is required.

Equipment that is owned by the contractor will make an effort to have its maintenance expenses paid for on the worksite and not cost-coded to the home office, whether it is owned domestically or via a separate but internally owned equipment firm. Repairing the machinery while it is still on the worksite is the best way to do this. Again, to keep expenditures out of the home office books, the worksite team may continue to pay rent for its own company's equipment while it is being repaired even if it is not being used. Even after the equipment has completed its intended purpose on the project, it may remain in the worksite equipment log for an additional week while regular maintenance is carried out before it is moved to a different project or the company's storage yard. Open-book customers who are savvy may forbid contractors from doing job-cost equipment maintenance, which raises the danger of the contractor using their own equipment. Continuous safety code or regulatory changes mandated by the State that force contractors to update or adapt their equipment provide an extra risk for self-owned equipment. If the equipment is leased from a third party, the provider is solely responsible for these risks.

Depreciation

Depreciation indicates the typical ageing or wear and tear that fixed assets, such as structures and construction equipment, experience. All assets have a finite useful or productive life and depreciate immediately after being acquired. The IRS has set a maximum of depreciable years for each kind of asset, which is covered later, even though the precise length of every asset's useful life is unpredicted. The pickup vehicle the superintendent uses has "depreciated" in value over the course of its second year of use and is no longer worth what it was when it was new. By the conclusion of the equipment's useful life, there wouldn't have been a money ready to buy its replacement if just rent is paid on assets and depreciation is disregarded. The establishment of a reserve fund for equipment replacement is one goal of depreciation.

Only movable property may depreciate. This comprises structures, tools for construction, furniture, and office supplies. People and uninhabited land cannot be devalued. The majority of construction firms are not engaged in the business of purchasing, repairing, or running buildings. As will be covered later in this book, real estate developers' goal is this. Real estate investing is a fairly dangerous endeavour, therefore if the construction firm owns any buildings, they would probably set up separate LLCs for each one, just as equipment businesses do. The main topic of discussion will be depreciation in relation to construction equipment held by contractors. When equipment is bought, it appears as both an asset and a liability on the balance sheet, either in the form of increased owner's equity or a long-term bank loan. Asset and obligation are in balance.

The majority of this depreciation discussion is centred on company-owned buildings and equipment. In the same way that maintenance and licencing were previously mentioned, contractors' depreciation problems will be resolved if they rent equipment from outside sources or if subcontractors provide the equipment. The CFO manages the depreciation procedures for company-owned equipment, not often the worksite accountant. It is important for the project manager and jobsite cost accountant to grasp some of the fundamentals underlying these procedures even if businesses that own a lot of equipment would want to have at least their depreciation and loan payments covered by jobsite rent or income. Depreciation should be tracked or accounted for the following three main reasons: tax reporting and payment; impact of equipment income, cost, and depreciation on financial statements; allocation of equipment expenses to projects instead of home office overhead. The estimated salvage value is deducted from the purchase value and divided throughout the usable life of the asset to establish the overall and monthly part of the original purchase value that the contractor intends to depreciate, as shown by the following equations:

tax deduction for depreciation

One of the biggest tax advantages available to corporations and investors as well as construction contractors that own buildings and equipment is depreciation. Depreciation, which is used to counteract other financial benefits, on paper reflects a decrease in asset value and, thus, a loss in revenue. Depreciation only results in a paper loss of the asset; there is no real cash outflow, unlike when salaries are given to construction workers or when concrete is bought. Corporate CFOs and accountants who prepare taxes, or their external CPAs who file taxes on behalf of contractors, will adhere strictly to the IRS's depreciation regulations. Congress enacts legislation; the IRS does not write tax laws. For the benefit of the United States Government, the IRS oversees the tax collecting procedure approved by Congress. Form 4562 and its instructions, as well as Publication 946, are two IRS documents pertaining to construction asset depreciation (www.irs. gov). These instructions are accompanied with the asset useful lives as calculated by the IRS. The usable lifetimes of some of those goods, which are most often used by construction enterprises, are provided.

The IRS recognizes three strategies that contractors may use to tax-efficiently depreciate their equipment. The two ways permitted by law under the modified accelerated cost recovery system and the straight line approach are included in the three methods for tax depreciation (MACRS). These two are predicated on the idea that an item loses value more rapidly in the first few years of its existence than later on. These two comprise the 150% declining balance strategy for equipment with a useful life more than five years and the 200% double declining balance approach for assets with a useful life of five years or less.

Depreciation for use in internal accounting

It is not a negative cash flow pull for equipment that is owned by a contractor and fully job-

costed. Yet, unused and stored equipment has a negative impact on the contractor's revenue statement. While the amount of rent paid by the project, most likely via a journal-entry transaction, is about equal to the amount the equipment has depreciated or lost value and loan coverage, internally owned equipment is also not a source of profit for the contractor. The following financial statement actions apply to internally owned and job-costed equipment:

The balance sheet Each month, the asset's depreciation is deducted from its book value. As a result, the asset's loan, which is a long-term debt, is financed in part by the rent collected.

Income statement: Rent for equipment and maintenance costs are paid as job-costs and should add up to the amount of bills sent to and money collected from the customer. Depreciation is shown as an expenditure for company-owned equipment on the income statement.

Equipment ledger: A reserve fund is raised as the value of the equipment is reduced or depreciated.

History of job costs report: A continual, thorough, and current accounting of all rent payments and, if necessary, maintenance expenses made by the job. A whole distinct set of financial statement outcomes, including a loss of potential income for the firm, occur when equipment is idle and not job-costed. Company-owned equipment should be entirely job-costed. Commercial contractors must account for their equipment differently than heavy-civil contractors, who often use fewer subcontractors and own and operate more of their own equipment. If the equipment is not held by the firm, costs are recorded on the income statement, invoices are handled similarly to material purchases, and the work cost history report and the accounts payable report are both affected. Contractors may internally account for depreciation using one of three ways, including the decreasing balance approach, the sum-of-years or digits approach, and the straight-line and two accelerated approaches. The falling balance and straight-line techniques are comparable to those used for taxation. The sum-of-years depreciation technique takes early-asset accelerated depreciation into account. Using this technique, the straight-line depreciation formula is changed to Dn = (P-S) x fraction. Depending on the asset's useful life and the number of years left to be depreciated, the percentage changes every year.

The jobsite cost accountant is one of many components of construction equipment that should be carefully considered by the owner of the contractor and the project management team. Depreciation is one of several kinds of equipment and assets that must be managed and reported on for tax and financial planning reasons. Contractors may either own their own equipment, form separate equipment firms as LLCs, or rent equipment from other parties. Contractors strive to keep all equipment in use on building sites rather than having it lie idle in the company's storage yard. One strategy for controlling costs and shifting risks is to demand that subcontractors provide their own equipment. All construction equipment must only be operated by skilled and licensed personnel. Both financial and productivity effects on the worksite might result from equipment maintenance and repair. To determine needs and allowances for equipment rental and maintenance, particularly with regard to contractor-owned equipment, the project manager must consult his or her contract with the client. Depreciation is the term used to describe the gradual decline in asset value. A construction business may depreciate all of its fixed assets, such as its buildings, machinery, and office furniture. Three techniques and time frames have been developed by the IRS for depreciation of each item that contractors may use on their tax returns. The straight-line method counts on a constant annual depreciation rate over the life of the asset. Two accelerated depreciation techniques take into consideration equipment that depreciates more quickly in the first few years of use, enabling the contractor to claim bigger early tax savings.

Money flow

Several different tools are used in building. Nowadays, instead of using drafting boards, architects utilise computers to create drawings using tools like building information modelling (BIM) and computer-aided design (CAD). In the past, surveyors would use a level or transit; nowadays, they probably employ a laser or total station. In the field, plumbers and carpenters both utilise pipe wrenches. As mentioned throughout this book, project managers (PMs) and project engineers (PEs) employ a number of construction management document tools, the majority of which are created and communicated on computers. Balance sheets, revenue statements, and cost ledgers are just a few of the financial statements that accountants utilise as tools. They no longer create the majority of their accounting papers on enormous ts of grid paper, instead using computers. Cash is one tool that project owners have utilised with general contractors (GCs) and GCs similarly with subcontractors for hundreds of years and will continue to do so in the future, despite the fact that many construction management tools have changed. The next possible contract is a mechanism that project owners and general contractors may both employ when dealing with subcontractors, but without payment, contractors will experience financial hardship and may even file for bankruptcy. For the sake of this discussion, "cash" refers to a positive money flow via the bank rather than necessarily physical currency like dollars and coins. In actuality, relatively few contractors will transact with hard money, and those that do may be attempting to evade other taxes. Even profi contractors that have a solid reputation for doing high-quality work safely may run into financial trouble if they are not paid on time and do not have a healthy cash flow. Subcontractors and suppliers, particularly those who are subcontractors to other subcontractors and are located distant from the customer and the bank, are particularly affected by the absence of a solid positive cash flow. The main cause of contractor failures is probably a lack of financial flow. together with other parties involved including the chief executive officer (CEO) and the boards of directors and equity partners. One of the distinctions between construction and other industries—which has already been mentioned—is that each worksite represents a separate source of income. The home office depends on its building projects to generate cash in the form of monthly payments from its customers. To examine the corporate cash flow situations, all of the project revenues and expenses are added together. Many CFOs will leverage the positive cash flow produced by the construction teams to create additional revenue via short-term investments in stocks and bonds, the operations of equipment companies, and real estate purchases. An individual project manager and worksite accountant are not responsible for the home office cash flow, but each of their jobsite cash flow initiatives helps the company's bottom line.

This will go into great depth on how to create a cost loaded schedule, which is the first step in creating cash flow curves. There are various components to the idea of cash flow, the majority of which are covered by the general idea of cash inflow and outflow. The cash flow is negatively impacted by all of the many worksite expenses, including personnel, material, equipment, subcontractors, and indirect costs, which must be tracked. The only significant source of positive cash flow for general contractors is client income. Contractors usually want to operate in the black, meaning that their cash inflow exceeds their cash outflow. The numerous strategies that a contractor might use to strengthen its financial situation are also covered in this article. Some of them uphold moral principles, while others don't.

Process for cash flow curve

A cash flow curve is an estimate of the total cost of the work that will be finished each month while the project is being built. By cost loading the time and charting the entire monthly expenses, it is made. That is often one of the first questions the owner would ask to the

project manager, and the building contract can stipulate that it is necessary. This is necessary, among other things, to advise the bank of expected monthly payments. Several PMs object on the grounds that the curve will be incorrect and that they risk being punished as a result. Receiving payment from the owner for the work that has been done on the project is the most crucial thing a PM performs. "Payment Requests." If a cash flow curve is necessary to make payments easier, it should be created.

Schedule with costs

The creation of a cost-loaded schedule is the first step in creating the straightforward cash flow curve. A summary schedule and a summary estimate are the first steps in the cost loaded schedule development by the estimator or cost engineer. The cost loaded schedule may benefit from comprehensive versions of these, however schedules and estimates with hundreds or thousands of line items may be burdensome. Less than 25 events are usually too few for schedules and summary estimates; 40–50 activities would be preferable. Something with more than 100 would likely be superfluous even if it is still useful. Both the summary schedule and the summary estimate should more or less have the same list and description of the activities. The easiest way to describe how to create a cost-loaded time is with a series of detailed instructions, like the ones below:

Create an Excel spreadsheet first. The left side of the page should be used to list direct work tasks. The following column should include the cost of such actions. Underneath the direct work activities, add a subtotal row and add the expenses vertically down. Check to see whether the subtotal cost here corresponds to the subtotal cost in the summary estimate. It's possible that some of information was copied and pasted from the values summary schedule or pay request (SOV).

List the weeks for a short-term project or the months from the construction schedule at the top of the Excel worksheet.

Consider the projected expenditures for each direct work activity and distribute them in accordance with the completion dates of the activities. Here are four examples of possible distributions of direct costs:

Put $90,000 in May next to the foundation line if the foundations cost $90,000 and will be paid for in May.

The installation of structural steel, which is expected to cost $270,000, takes place in months six and seven and may be divided equally at $135,000 each month.

Suppose that construction on the outside skin, which will cost $720,000, will begin in the middle of December and go through February and March. The expenses should be prorated as follows: 16.67% - 33.3% - 33.3% - 16.67%

According to this, $120,000 will be spent in December, $240,000 in each of January and December, and the last $120,000 will be spent in March. As this is not an exact science, precise estimations and dates are not required. In the end of the day, rounding all of these percentages and dollar amounts to the next full digit could be quicker and equally accurate. In none of these calculations, use cents.

10% of the $1.2 million plumbing subcontract is credited to the second month for under-slab rough-in, 50% takes place over a three-month period when wall and ceiling rough-in are planned, and the remaining 20% is credited to the trim and testing phases of the project. This amounts to $120,000, $200,000, $200,000, $200,000, $240,000, and $240,000. If any of the work line items need a minor change, do it within the last month.

For each month, add up the spread of direct labour items. Add a row for general worksite circumstances at the bottom of the page, below the direct work subtotal row. One of three ways may be used to distribute or proportionate the general conditions: Distribute the overall conditions uniformly and equally across each month. Spread the general circumstances out proportionately such that, for example, if they account for 6.8% of the total direct work estimate, 6.8% of the subtotal direct work total should be attributed to general conditions on the page. Choices "a" and "b" are both simple to calculate, comprehend, and accept by a client, but neither will be entirely correct. Estimate the monthly cost of maintaining the general conditions of the worksite. Due to activities like mobilization, buyout, and close-out, most projects have more uniform distribution throughout the middle of the project and more general circumstances at the front and rear ends. This is arbitrary and hard to predict with any degree of certainty. To keep the expenses organised, there cannot be too many different subtotal sets. Each of the direct work tasks should be added to a column on the schedule's far right side. The sum of these totals should match the initial estimations that were brought forward from the summary estimate on the far left-hand side of the page. If there is an error, fix it right away. If minor changes are required, make them either in the first or final month that an activity takes place.

The entire direct expenses should be included after the spread of general conditions in a new subtotal row. Any markups, such as labour cost, fee, insurance, contingency, taxes, and others, may be placed together in a new row (or more) designated for markups. Determine what percentage of the subtotal for direct and indirect expenses each of these markups represent. Pro-rate the markups across the sheet to the right using this percentage. In projects that need a significant quantity of direct work, which often happens early in the project, the labour load may be divided out separately. A pro-rata share of markups being billed in the same manner that this schedule is being created is accep to the majority of clients. Subtract the subtotal direct and indirect expenses from the markups, then add a total row below the markups. The totals in the columns on the far left and far right of the sheet should match the amount specified in the contract. If not precisely, go back and fix the mistake.

The cost information that is now added up for each month at the bottom of the schedule should represent the projected monthly project costs. With the input of the thorough estimate, the majority of scheduling software applications can create a "precise" schedule of values, but the line items must once again be perfectly synchronised. The machine will just conduct the arithmetic and not the reasoning involved in distributing the expected expenses. The possibility of each material supplier and subcontractor billing the general contractor in accordance with any expected timeline is quite unlikely. The contractor would often just publish the monthly total s from the bottom row instead of providing the customer or the bank with all the details on this cost-loaded plan. The following on pay requests will cover how to modify these monthly sums for retention and sales tax. The cost loaded schedule for Evergreen Construction Company's Olympic Hotel and Resort case study is shown. This is a reduced quarterly version of the 16-month analysis that is part of the eResource due to space restrictions.

Today it is easy to draw a cash flow curve. Again, using scheduling software, this may be accomplished with a few keystrokes. Either a bell or a "S" shape is used to represent the cash flow curve. The projected value of work that has to be done each month is shown on the bell-shaped curve. An analysis of the cumulative value of the work completed each month is shown by the S-shaped curve. The monthly curve is relatively flat and does not effectively express the change in anticipated financial requirements, thus it is advisable to put both curves on the same sheet but with separate vertical scales. A conventional or "perfect" bell-shaped curve may be reflected in the monthly s by certain project managers. This is

permissible for presentational reasons within reason, but it is not necessary. In reality, many cash flow curves seem more like a double-humped camel than a bell. This happens when there are significant project expenditures both early and late in the project, such as upfront payments for long-lead equipment and site and structural construction, as well as pricey finishes and trim for the mechanical and electrical systems. In the example case study, a remote hotel project, significant costs for concrete in the building and garage, structural framing, and interior finishes were realised early in the project.

Construction site costs

One of the most important and time-consuming components of cost management is monitoring task expenses, as was previously mentioned. The project engineer, cost engineer, or worksite cost accountant will be primarily responsible for monitoring jobsite expenses during construction. Costs have to be precisely recorded and reported in advance for the fourth phase of the cost management process—modifying processes, systems, and sometimes even people—to be successful. The reader is advised to review the cost control cycle. In earlier chapters, the procedures for buying out suppliers and subcontractors as well as for creating and carrying out purchase orders and subcontract agreements, were also covered. Expenses get "committed" when contracts are awarded to suppliers and subcontractors, as well as when supplies are delivered and work is done on the project site. These same committed expenses are recorded after bills and time sheets have been received and/or authorised by the worksite team. The costs are actually expended when checks are cut or electronic deposits are made. Different accounting systems and different contractors may account for 'costs incurred' under any of these scenarios. In this section, each of the activities and steps associated with tracking direct labour, materials, equipment, subcontract costs, and jobsite general conditions are stepped through.

Investments in equipment

That will be quite similar to how items bought using short-form purchase orders are processed while processing equipment rental bills. If there are questions about the amount of time spent on the project, the superintendent's diary of the general contractor (GC) and the worksite equipment ledger will be compared. For further information on the usage and depreciation of equipment, go to the preceding chapter.

Similar to a general contractor, subcontractors execute work throughout the month and have equal labour, material, and equipment expenditures. On the 20th of the first month, subcontractors must submit their pay requests to the GC, which will predict the amount of work expected to be completed until the end of that month. Requests for subcontractor payments received to the general contractor's home office are registered as accounts payable and transmitted to the worksite for approval. The jobsite cost accountant will designate the proper cost code for each subcontractor and ensure that the overall amount invoiced does not exceed the amount permitted in each contract. The cost engineer will provide first clearance to the subcontractor pay requests, much as they do with material bills. After reviewing and ensuring correctness of subcontractor pay requests, the project manager will then include them in the overall project pay request to the customer for month one. Each subcontractor will be subject to a retention withholding of five or ten percent, which is the same percentage the client would be keeping from the GC.

With each subcontractor request, the PM and superintendent may need to walk the project to confirm the % completed. The superintendent should also sign off on the approval of the invoice. As a method of accounting checks and balances, many contractors would incorporate extra tiers of invoice approvals from home office officers. The architect, bank, and/or

customer will all get a draught project pay request from the PM on the 25th of the month, along with line items for each subcontractor. By the 30th of the month, the official, amended GC payment request will be sent to the client and subsequently the architect for approval. By the 10th or 30th of the second month, the customer will pay the GC. Ten days after receiving payment from the owner, the GC's home office accounting department will issue checks (or make electronic payments) to the subcontractors.

A "pay-when-paid" condition, which enables the general contractor to defer paying subcontractors until the customer has done so, is often included in subcontracts. By doing this, the GC avoids having to utilise its own money. All contractors want to operate profitably, which implies they have a steady flow of cash. On the other hand, if the GC is losing money, it will need to borrow money from a bank or other equity partners since it has a negative cash flow. See techniques to increase cash flow that will be covered later. After the first subcontractor's payment, which may come up to three months after the delivery of the supplies or the completion of the job, third-tier subcontractors and suppliers are then paid ten or thirty days later.

Costs related to normal jobsite conditions

Indirect materials, equipment rental, and indirect labour costs are part of the overall jobsite circumstances, as was mentionen. Similar to short-form purchase order materials and equipment, indirect materials and equipment are invoiced. Salaried employees like the superintendent, project manager, and cost accountant for the worksite make up indirect labour. Indirect cost tasks like cleaning, forklift operation, and other temporary support tasks are also carried out by hourly direct artisans. The accounting for direct artisans engaging in indirect activities is the same as that previously stated for craftsmen engaged in direct activity. Payroll staff, such as the PM, superintendent, and cost engineer, often do not complete time sheets for their crews as foremen do. Within the worksite general conditions estimate, each is attributed to a different cost code. A percentage of the home office's monthly compensation is regularly recorded against each employee's unique cost code and included in the labour report and work cost history report. A PM may sometimes fill out time sheets for the members of his or her worksite team. The frequency of salary payments, which typically occur twice a month, varies amongst businesses. Assume, for instance, that they labour through the 15th of month one before receiving payment for that half-month on or around the 22nd. The home office payroll clerk would then disburse their compensation for the second half of month one on or around the seventh of month two. Payroll for salaried employees is often handled nowadays by direct deposit into the employee's bank account rather than via a traditional paper check.

Site Earnings

During the month, a number of worksite expenses reduce the contractor's cash flow; in contrast, there is only one source of positive cash influx, and that is when the customer pays the contractor. On or around the 10th of the month after the completion of the job, this typically occurs once every month. Clients sometimes wait to make payments until the 30th of the month after the one in which the service was completed. The next discusses the pay request procedure. Residential house builders that are acting speculatively get one cheque for each home they sell or close on. Because of their uns cash flow, speculative builders sometimes depend on construction loans to cover their weekly and monthly payments until a property is sold. Similar to commercial contractors, custom house builders will get monthly draws from their clients. A down payment from the customer or the bank is sometimes given to remodelling and custom house builders, giving them a chance to stay in the black while work is being done.

Net cash flow and implications for the home office

The CFO gets monthly checks from all of the contractor's customers and manages cash flow as required to pay for all of the contractor's worksite expenses. The officers and front office of the contractor depend on a positive balance of cash flow, not a negative balance. When sales are more than expenses, there is positive cash flow. They anticipate more income than expenses. In the event of a short-term cash need, the CFO will draw on an existing line of credit with their bank and repay the borrowed monies as quickly as feasible. Officers of a construction firm are normally answerable to a board of directors, equity investors, and partners, unless the company is controlled by a single person and runs as a sole proprietorship. Due to the considerable risk involved with owning and investing in construction enterprises, these equity partners do not anticipate having to pay out of pocket while the contractor is operating in the red; instead, they anticipate positive cash flow and an above-market return on equity. Early in the project, when a greater quantity of direct labour is required to create the structure, revenues usually lag behind costs. Weekly direct labour payments are made by the general contractor, who does not deduct retention from the craftsmen's paychecks. As the project progresses, such as during finishes, the mix of subcontractors from whose retention is being withheld increases, which reduces the GC's demand for cash flow. When there are more subcontractors than direct labour and material costs, the GC's revenue curve will climb above the expense curve. Similar to drawing the cash flow curve, there is no specific date for when this will happen, although for the majority of normal commercial construction projects, which use 80–90% subcontractors, it is often around the halfway point of construction.

How to increase cash flow

General contractors are not in the business of giving their customers loans for building, as has been frequently noted. While they operate in the red and include the corresponding interest expenses in their home pricing, speculative home builders will take out loans and repay the bank when they sell the property. Real estate developers may also get construction loans, and their loan payments are taken into account in their pro forma. Commercial general contractors (GCs) anticipate that their customers will get construction loans in order to meet their monthly payment obligations; in fact, confirming that the owner has financing in place is a necessary condition for a successful contract execution. There is just one source of income, which happens every month and up to 40 days after certain contractor costs were incurred or committed. Earlier, a lengthy list of worksite expenses and the procedures required to authorise invoices and make payments were covered. So how can a contractor make money without having to borrow it? There are several options available for the GC to strengthen its cash flow position on the worksite, some of which are accep if negotiated into the contract conditions and are ethical and lawful, while others are totally unethical. If any of the items in the second bullet-list are employed and the contractor's practises are found, there might be major consequences for the general contractor from the customer or even from subcontractors. We don't urge any contractor to include them in its project design at all.

Moral ways to increase your bank account

The general contractor is financed by the subcontractors since they are not paid until the customer pays the GC and because subcontractors are subject to the same retention restrictions as the client. A GC's cash flow situation is improved by hiring more subcontractors and lowering the proportion of direct labour, direct material, and equipment rental. In the list of values, add a mobilisation fee. With major civil construction projects, this is typical. Demand a down payment from the customer. This is typical for many different kinds of renovation or bespoke home projects. Several manufacturers of electrical and

mechanical equipment, as well as elevator subcontractors, demand down payments. If the contract permits, bill the customer twice a month. The customer pays the GC sooner, for example, on the 10th of month two rather than the 30th, or even better, on the 5th rather than the 10th. The GC should submit an early pay request even if the first month's or partial month's expenses could be low in order to a) enhance its cash flow and b) test the pay request procedure, which will be covered in the following chapter. Reduction held retention from 10% to 5% Eliminate the client's retention held on labour, material, equipment, or indirect expenditures as the GC does not withhold retention on these expenses. Hence, only the amount of retention maintained on the GC's subcontractors is retained on the GC. Release the retention on the job that has been finished and accepted. Early subcontractors in the fields of excavation, shoring, and site utilities often did this. This early release has to be included in the primary contract in advance. If the contractor completes the job for less money than they anticipated and bills in accordance with a set schedule of values, their cash flow situation will improve. Due to the fact that bills for time and material projects and cost plus percentage fee projects are based on actual expenses rather than anticipated or planned costs, this is not feasible. Depending on the arrangement, the GC may be able to charge the client a big amount up front for all of its insurance and other markups and then distribute money on a regular basis. Each monthly draw will be accompanied by a commensurate fee invoice. The contractor will bank the charge instead of paying it out. As direct work is riskier and often completes quicker than subcontracted work, some general contractors (GCs) negotiate a greater price to be paid on their direct work than on subcontracted work. The majority of customers are aware that GCs are not banks and will consent to some SOV front-loading, as outlined in the section below, but not excessive amounts.

Unreliable cash-improvement techniques

Before creating the schedule of values, adjust the estimate to include extra expenses for early construction activities. For instance, suppose the SOV reported $300,000 for the foundations and $140,000 for the hotel rooms' kitchenettes, whereas the initial estimates for both items were $90,000 and $350,000, respectively.

Instead of fabricating the SOV, as was previously described, front-loading the SOV is achieved by allocating an excessive amount of worksite general conditions and fees, as well as other markups like insurance and taxes, to those activities that take place early in the project. Open-book negotiated contracts, where these markups are invoiced as independent line items as outlined in the following chapter, seldom allow for this to happen.

Subcontractors up their monthly demands for payment and erroneously record those payments on the GC's SOV to the customer. Hold money back from the subcontractors' checks over the retention held owing to unresolved issues or back charges, despite the fact that the project owner accepted and applied the subcontractors' bills to the SOV at face value. Keep the money from the subcontractors even after the GC has been paid. Our recommended time frame for a team-build project is ten days after the client's payment to the general contractor (GC), although some GCs pay their subcontractors 30 days after receiving payment, and some subcontractors do the same with their third-tier subcontractors and suppliers. Hold more GC retention than the customer does for subcontractors. For instance, the GC would keep 10% of the subcontractors' payment if the customer held 5% of the GC. Typically, contracts forbid this.

One of the most potent weapons a customer has against a general contractor and against a GC against its subcontractors is cash. One of the most frequent causes of contractor bankruptcy is a negative cash flow. Contractors who consistently depend on the bank to support their operations but yet provide high-quality work that is safe, timely, and within their budget will

eventually collapse. Speculative home builders and real estate developers vary significantly from commercial contractors in that they receive construction financing and then see a significant increase in positive cash flow when the project is finished. Yet their projections and pro forma took into account the interest they pay on the construction financing. Contractors anticipate that clients in commercial construction, including those in major civil and bespoke house building, have already secured a construction loan or have other money available. To help the owner and the bank analyse future financing commitments, the project manager should complete the straightforward process of developing a cash flow curve. A cost loaded schedule that is created using the contractor's summary schedule and summary estimate is used to show the cash flow curve. The work-in-place curve is the most typical and straightforward from the contractor's point of view among the several cash flow curves that may be shown. Processing of monthly bills and payment receipts will come around a month after this curve.

Revenues minus expenses equals net cash flow. For commercial contractors, payment is often made on the 10th of the month after the job was completed. There are many periods during the month when expenses happen. The costs associated with a jobsite include personnel, supplies, tools, equipment, subcontractors, and general upkeep. All of these expenses have their invoices handled in somewhat different ways with assistance from the worksite cost engineer and the home office accounting department. Payments often come a week or two after material delivery and installation. Subcontractors are paid ten days after the customer pays the general contractor (GC). Pay-when-paid is the name of the procedure, which aids the GC in managing their positive cash flow. The contractor has a number of options for achieving its objective of having a positive cash flow and operating in the black. There are some of them that are moral and some of these that are not. Open-book pay requests that are prepared on time, accurately, and fairly are the greatest way to increase cash flow.

CHAPTER 9
PAYMENT REQUESTS

[1]Dr. Geeti Sharma, [2]Supriya Rai
[1]Assistant Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Associate Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.geeti_sharma@cms.ac.in, [2]supriya@cms.ac.in

One of the most crucial worksite processes that construction project managers are in charge of is being paid for the work done. Even if a project manager (PM) has all the tools required to turn a profit on a task, the contractor will not be able to turn a profit if the owner does not pay for the work. Some PMs fail to see the significance of creating timely payment requests. With several subcontractors, this is particularly true. The contractor will probably not be paid on time if a payment request is not made in a timely manner. The general contractor (GC) must manage their cash flow carefully or they risk being unable to pay their suppliers, craftsmen, or subcontractors. The last covered the significance of having a positive cash flow. To effectively contribute to the running of the construction firm, PMs must be able to control the cash flow on the worksite.

One of the most crucial facets of construction financial management for the project manager is processing pay requests. While it is shown in this book as a worksite activity, the PM will have assistance from the home office accounting department. Contracts, schedules of values, retention, and lien management are a few of the construction management facets that are related to and engaged with the pay request process. All of these factors, as well as others, will be covered in this along with how they impact the contractor's requests for progress payments and how they interact with the cost accounting procedures. The words pay estimates, invoices, bills, draws, and progress payments are all used by certain members of the built environment business, although they are all regarded equivalent for the purposes of this article. This heavily cites Management of Construction Projects, a Constructor's Perspective (MCOP) by J. Schaufelberger and L. Holm (2017). It is advised that the reader consult that source for further information on payment requests and other complex project management procedures.

Contract formats

The construction business, as previously said, is unique from other sectors for a number of reasons, one of which is the method of monthly payment. The contract's supplementary or special conditions detail the forms and deadlines for compensation requests. Article 12 of the AIA A102 cost plus fee with a guaranteed maximum price (GMP) contract details the payment mechanisms utilised on the Olympic Resort and Hotel. Many of the payment procedures are the same regardless of the kind of contract. Some of the pay request variations that are impacted by various contract types will be covered in this section. Open-book cost with a maximum price guarantee Regarding the monthly pay request procedure, construction contracts are different from lump sum contracts. On the basis of actual and anticipated expenditures, the project manager asks compensation. He or she must be in possession of bills from suppliers and subcontractors. In general, the PM is obliged to provide the project owner with backup documentation along with the payment request, such as subcontractor invoices and general contractor payrolls. An SOV and percentage of completion are used to

charge fees, direct work items, and general conditions expenditures. As open-book projects are often the subject of periodic owner audits of the actual costs spent, it is very difficult to overbill them.

Payment under a lump sum contract is also determined by a previously defined schedule of values and a completion percentage. For this kind of contract, front-loading and overbilling are both possible as we'll cover later. With a closed-book lump sum contract, audits of general contractor records are infrequent. Payment is made according to the amounts that are actually installed under a unit pricing contract. The contractor will be paid $20,000 (100 LF x $200/LF) minus any agreed-upon retention if they are to be paid $200 per lineal foot (LF) for installing a water line in a distant area and they have completed 100 ft. This procedure may be aided by a third-party quantity measuring person or company and is quite objective. A time and materials (T&M) contract bases payment on the number of real work hours multiplied by the labour rate, plus material reimbursement based on supplier invoices. For a T&M project, a loaded pay rate comprises the cost of labour in addition to markups for overhead and profit.

Schedule of values

Creating a schedule of values, or agreed-upon breakdown of the contract costs, is the first stage in creating a construction pay request. A SOV will often need to be presented for approval within a certain window of time after contract execution, such as one week. Early in the project, far before the first significant payment request is made, and only after all subcontracts have been granted, this SOV should be prepared and approved. If the SOV is created before the subcontractor buyout, it may not be correct and may be challenging to bill against. Similar to how the cost loaded schedule is created, one typical approach to developing the SOV is to start with the summary estimate. The GMP cost column, located in the middle of SOV, displays this. The fact that the general terms and price are specified separately makes this the SOV that would be utilised on a cost-plus contract. The general terms and charge would be allocated proportionally among all payment items under a lump sum contract, as seen on the right. None of the other columns would be visible, and the far right column labelled "adjusted totals" would be the SOV that the project manager would submit for a lump sum contract. Here again, the same cost codes that correspond to those in the estimate and time should be used. Some contractors think they may overcharge the project owner or conceal genuine estimates or cost values by grouping line items inside the SOV together, resulting in fewer line items. The SOV has to be as specific as possible. The project manager must take all reasonable steps to help the owner make full and timely payments. There should be no secrets. Line items should at least include the previous 16 Construction Specifications Institute (CSI) divisions or relevant divisions from the new 49 CSI divisions. If feasible, major subcontractors should be named. A thorough SOV should list each particular building part, building wing, separate site region, phase, or system. For a closed-book project, a condensed SOV may resemble. It could be challenging for the PM to convince the owner and the bank to approve the monthly pay estimate with such a condensed or summary SOV. The contractor's ultimate aim of receiving payments on time is facilitated by an open and honest pay request procedure.

Even though the contract does not mandate it, it is a good practice for the project manager to provide the suggested SOV to the project owner. The PM doesn't want any more disagreements over a payment request with an owner or architect. Similar to how a door hardware schedule would be presented for approval, the SOV should be. The majority of project owners value a contractor's openness because it fosters fast payment and builds the essential respect and confidence. Cost-plus contracts with predetermined maximum prices

often have the charge billed as a percentage of the project's total completion level. 80% of the money has been received if the job is 80% finished. Most owners won't have a problem with this strategy. As was addressed with the production of the cost loaded schedule in the previous chapter, general conditions on cost-plus contracts may be invoiced in one of three ways: straight line with equal payments for each month, % complete based on work completed, or actual costs incurred.

Change orders that have been accepted may either have their values distributed among the relevant schedule of values line items or they can be added at the end as new line items. While the second technique is often the simplest to manage, it makes it more difficult for the owner to keep track of monthly subcontractor payments and final lien releases. On the other hand, reformatting the SOV each month by dispersing modification orders might result in the deletion of the record of the original SOV. Certain contractors, particularly those that focus on lump sum bids, may recommend front-loading or concealing the cost and general terms. Under a bid contract, this occurs more often than with negotiated work. We advise listing each line item exactly as it would be in the project cost accounting system, including the charge and general conditions. The value schedule must resemble the contractor's estimate. If the contractor is discovered, it will be challenging to justify why the price of the under-slab utility work was represented as $50,000 in the pay estimate but was only $20,000 in the initial bid during an audit or claim scenario. Both guaranteed maximum price and lump sum projects often distribute the fee and general conditions as a weighted average over the SOV. Although this may be fair, it will be difficult for the project owner to manage lien releases, as will be covered later.

Request for Payment Process

Typically, construction invoices are sent out at the end of each month. The project manager will get assistance from the jobsite cost engineer in gathering all of the charges for the monthly request that has to be approved by the architect or owner. On or around the twentieth of the month, this procedure should begin. The general contractor should be expected to receive monthly bills from subcontractors and significant suppliers by that date. Subcontractors often struggle to effectively manage their cash flow. They must be urged by the PM to submit their monthly billings on time. Some general contractors (GCs) have the mentality that if the subcontractors don't submit their bills on time, it's their fault and they won't be paid this month. Despite the fact that this may be legally correct, it is ineffective. The contractor's worksite crew must take all reasonable steps to ensure that the subcontractors have access to sufficient funds to avoid bankruptcy, at least while they are working on this project. A top executive at a major GC said that his company personally phones its subcontractors each month to remind them to submit their bills on time (rather than doing so through email). The proportion of work that the subcontractors anticipate finishing and having in place by the end of the month should be reflected in their bills, which should be received on the 20th of the month. Also, the suppliers provide an estimate of what they will send to the location at the end of the month. Their contract agreements will have specified these deadlines. The project manager and superintendent for the general contractor predict the anticipated cost of the direct work activities they want to have running until the end of the month with the aid of a worksite cost engineer. The payment for supplies that have been delivered to a subcontractor's warehouse but have not yet arrived on the project is often requested by suppliers and subcontractors. Sometimes fabrication is required, like with roof trusses or hotel room kitchenettes, or perhaps the supplier is ahead of schedule or the general contractor is running late. Payment for items held off-site is sometimes required for scheduling considerations. In rare occasions, it could be profi for everyone involved. For instance, the mechanical subcontractor was able to save money by purchasing the stainless

steel ducting for the kitchen exhaust along with supplies for another bigger job. Yet, paying for supplies that are kept away from the project site involves issues because of the possibility of theft or damage. In these situations, the project manager must ensure that both their own and the owner's interests are safeguarded. The material must be kept in a warehouse that is insured and bonded. Moreover, a personal examination and verification are required. There is another area where the worksite cost accountant might be useful. Most general contractors, architects, owners, and lenders attempt to avoid paying for materials that are held off-site, but if they are properly accounted for, it might be in everyone's best interests. The project manager and cost engineer gather all of these cost predictions, estimates, and payment requests on or around the 25th of each month, then put them together into a draught pay request to be reviewed by the bank, the architect, and/or the project owner. For each item on the schedule of values, this entails estimating the percentage of completion until the end of the month.

The project manager and jobsite cost engineer should plan a brief informal meeting with the architect, the owner, and the bank at the worksite to evaluate this month's proposed invoice once the draught pay request has been put together. Often, during the first project preconstruction meeting, all of these draught monthly pay request meetings are arranged for the whole project. The compensation proposal is provided as a draught for debate and approval at each of these sessions. The general contractor still has time to ask a subcontractor for clarification or come up with further information if any of the approvers have issues with a certain line item or percentage. The work completed or that will be in place by the end of the month may be visualised very well by doing a job walk at this meeting. Subcontractor invoices may be affixed to this draught as backup, if required. The meeting and its draught pay estimate encourage collaboration between the owner, the architect, and the GC's worksite financial team. For both bid and negotiated projects, same pay request review procedures are advised to ensure prompt payment. At the end of the month, the owner will receive the official pay request that the general contractor's project manager submitted for final approval and payment. If feasible, this may be provided sooner, but the main contract agreement will have specified this deadline. Payment conditions will also be included in the primary contract. If the payment request is received by the end of the current month, the general contractor should typically get payment by the 10th of the following month. Nevertheless, some project owners choose to pay on the 30th, which causes the construction team's cash flow to suffer. Article 12 of the AIA A102 contract details the precise timelines employed on the Olympic Hotel. To prevent the "check's in the mail" situation, the project manager for the GC could offer to pick up the monthly check and hand-deliver it to his or her CFO. To speed up this procedure, many contractors nowadays will include a direct electronic transfer method in their contract. The GC should promptly release cash to suppliers and subcontractors after receipt of the Owner's monthly payment. Typically, this is completed 10 days after delivery. Instead of delaying payments to suppliers and subcontractors, the GC should work to keep them solvent. In order to assure prompt payment, some third-tier suppliers and subcontractors may ask for joint check agreements between themselves, the second-tier subcontractor, and the general contractor. In this instance, a single joint check is issued with the GC as the major subcontractor, together with the primary subcontractor's supplier or third-tier subcontractor, as receivers. Joint checks eventually benefit and safeguard the general contractor (GC) and the project owner from the possibility that second-tier subcontractors may fail to make payments to third-tier companies, which may ultimately lien the project.

Dollars as a tool

Cash is one of the most effective tools the project owner has with the general contractor and the GC has with their subcontractors, as was covered in length in the previous chapter. On bid

day, a construction company could be offered more affordable costs if they have a track record of paying its suppliers and subcontractors on time. The GC will thus have additional job. GCs are not banks, and the same is true of subcontractors. Building construction is the GC's responsibility, not providing construction financing. Early in the month, each contractor starts to accrue labour and material costs. At the end of the month, these expenditures are billed, and payment is not made until the 10th or the 30th of the following month. This indicates that the GC has funded these costs for at least 40 and perhaps up to 60 days. For subcontractors, these timespan extensions might be up to 30 days longer. All contractors strive to front-load and overbill due to late or delayed payments from project owners to general contractors and from GCs to subcontractors. The result of overcharging is that contractors may be discovered, and the project owner and the bank may lose trust and confidence in the team on the worksite. In order to avoid putting the contractor in a scenario with a significant negative cash flow, the owner could permit a small amount of overbilling. The project manager should collaborate by limiting their overbilling, since doing so might complicate the monthly payment request procedure if detected. Front-loading the schedule of values is one method used by certain PMs to overbill. One way to do this is to include all fees and general terms (if not specifically mentioned elsewhere) on the early planned building tasks, such foundations or concrete slabs. Another option is to exaggerate these early operations or fudge the sums that subcontractors have asked for. These strategies are detrimental to construction with a team mentality and are often finally uncovered via interim lien releases or during an audit. An exercise for front-loading an SOV has been included at the conclusion of this for curious readers, however the author/contractor does not support the technique. Another example of utilising money as a tool is the usage of discounts in the pay request procedure.

Material suppliers could provide discounts in exchange for early payment. The general contractor may be eligible for a slight reduction off the invoice amount if they pay the invoice within a certain time frame, say ten days after receiving it. Due to this, a project manager may decide to pay suppliers in advance even if the owner hasn't done so. The GC is functioning like a bank in this situation. Some owners will wish to take advantage of these savings as well. Discounts from suppliers should only be transferred to the project owner if the owner has paid the general contractor in advance and the GC is not using its own funds to obtain the discount.

Retention

The project owner often withholds a percentage of each monthly pay request from the general contractor, who then withholds a share from its subcontractors. Another monetary instrument, this is known as retention or retainage. Retention serves to ensure that the contractor is committed to seeing the project through to its conclusion, including the closing out of all physical and administrative activity. The prime contract will determine the percentage of retention retained, while private projects may allow for discussion or renegotiation as the project progresses. In the past, 10% was the norm, but as contracts have grown in size and value, 10% is now widely seen as being excessive in the market. Nowadays, the most typical percentages are either 5% during the project or 10% up until 50% complete, after which no more retention is maintained, which also equals 5% at completion. A retention rate of 5% is stated in paragraph 12.1.7 of the AIA A102 contract agreement for the Olympic Hotel. The contract between the general contractor and each subcontractor should be linked to the main contract between the GC and the project owner. The subcontractor is often bound by the retention agreements the general contractor (GC) has with the owner in this fashion. This typically serves the subcontractor's interests and forbids the general contractor (GC) from excessive detention, which was one of the unethical methods for improving cash flow that

was covered in the previous chapter. Does the foundation shoring subcontractor have to wait until all of the interior painting punch list items are finished before receiving final payment if the owner keeps 5% of the overall work until 30 days after significant completion (the standard time frame)? This is unfair to the initial subcontractors and might have unfavourable financial repercussions that could eventually have an effect on both the general contractor and the project owner. To make it easier to pay off early subcontractors, it is a good idea to add a language in the prime contract that permits release of a percentage of the total retention. The garage shoring contractor may default on another job, but because the retention is still due, the project manager could be entitled to a lien on this project. In projects lasting a year or more, this is crucial but less relevant for shorter ones.

Many general contractors (GCs) who take pleasure in team-build projects believe that early subcontractors should be paid off provided final and unconditional lien releases are obtained 30 days after the early subcontractor work packages are finished. Nevertheless, not all project owners adhere to this viewpoint. Retention creates a fund to complete the job in the event that the contractors are unable or unwilling to do so. Contractors are encouraged to finish the job quickly by the prospect of being retained. Since the teams have previously collaborated, a general contractor could be able to persuade a negotiating project owner that they do not need to hold a significant retention percentage. Coincidentally, a mid-size commercial GC's charge is about equivalent to 5% retention. Each contractor should be motivated to complete the close-out process quickly and smoothly in order to get the final retention release.

Managing liens

Contractors and suppliers have the legal authority to file liens to ensure payment for the supplies and labour they supplied for the development of real estate. These rights are comparable to a mortgage in that they are attached to the property. If an owner owes a contractor money and won't pay, the contractor may place a lien on the owner's property. If the lien is not satisfied via payment, the lien claimant may file for legal foreclosure and request that the debt be paid from the sale of the property. A property owner may find it challenging to switch from a construction loan to a less costly permanent loan due to liens. At all costs, liens should be avoided. Dealing with them costs money, they make people feel awful, and they harm people's reputations. The owner should be protected against liens from third-tier subcontractors and suppliers as well as liens from the project manager's own subcontractors and suppliers by the cost engineer. The worksite financial management team may use the approaches described in this section to manage or avoid liens.

State legislation safeguards material suppliers' rights to ensure that project owners pay for the commodities they received. Suppliers are obliged to provide what is known as a materialmen's notice in the majority of countries. Informing the property owner that the supplier would be delivering materials to their project, this note is delivered. The notification is technically necessary in several places in order to protect the supplier's lien rights. Also, the general contractor is given certain notifications. All material notifications should be filed by the cost engineer with each subcontract and purchase order. It is reasonable for the GC to ask each supplier that submitted material notifications for unconditional lien releases after the project's conclusion. Each payment request from the general contractor should be accompanied by a conditional lien release, and vice versa for the GC's suppliers and subcontractors. Each time the GC requests payment from the owner, the contract may provide that the supplier or subcontractor submit an interim (or conditional) lien release. Regardless of the owner's needs, a project manager should require suppliers and subcontractors to provide conditional lien releases with their monthly pay requests. It is advisable to gather and file interim lien releases in case anything goes wrong. Whether a project has a lump sum or a

guaranteed maximum price contract, the general contractor (GC) must deliver copies of subcontractor releases upon request from the project owner. The more defence against liens the club can have, the better off they are.

Receiving payment triggers a conditional lien release. The contractor waives their right to make a claim for that particular sum if they are paid the desired amount. When a lien is unconditionally discharged, all outstanding debts have been settled and the associated lien rights have also been waived. In accordance with certain payment request rules, each payment request must be accompanied with a conditional release in addition to the unconditional release for the previous month's payment. Some business owners would even physically swap checks for the removal of liens. Lien releases may be made in a number of different ways, and many states provide standard lien release forms that are compliant with state regulations. Some owners may make attempts to persuade contractors to waive any liens that are not necessary by law. The phrasing of the lien release or payment request may sometimes conceal the release of claims for more labour. The conditional release is cumulative for the payments that have already been received, covering the month for which payment is sought. During close-out, a final lien release will be provided for the full amount of the general contractor's contract in order to get the final release of retention.

Contractors and suppliers place liens on the property of the owner. The GC seldom files liens. The lien was given to the owner by the contractor's supplier. The owner is anticipated to be shielded against liens by the GC. After a lien has been filed, the GC finds it very challenging to handle any further compensation demands. The PM and his or her worksite cost accountant or cost engineer, however, must comprehend and effectively handle contractors' and suppliers' rights to liens, as well as the related legal and contractual regulations, terminology, and timeliness.

One of the most crucial cash flow duties of the general contractor's worksite financial team is prompt payment receipt. Depending on the kind of contract, different payment demands must be sent in a certain manner. Applications for payment under lump sum and cost-plus contracts are supported by a schedule of values. The project manager is in charge of creating the payment request, ensuring payment is made, and then ensuring that suppliers and subcontractors are paid. The PM will get help with this from the worksite cost accountant. The PM should get in touch with the owner if payment hasn't arrived by the due date in order to find out why. The GC's PM is in charge of the contractual arrangement with the owner financially. The same situation applies to suppliers and subcontractors; the GC's PM sees to it that they are paid on time. To ensure the project is finished on time, owners often keep a part of each payment; the contract specifies the retention percentage. Due to the possibility of liens being put on a project if suppliers or subcontractors are not paid for their labour or supplies, project owners request that lien releases be filed along with monthly payment requests.

Taking change orders into account

Change orders carry out the same task but after the contract has been awarded, whereas addenda alter the project's scope before it is put out to bid. A modification order often affects cost and/or time in addition to changing the agreement's scope and terms and conditions. Change orders may be deductive if they remove work items or additive if they expand the scope of the project. Managing change orders is a crucial task in cost engineering and project management since they are a common occurrence in building contracts. The administration of change orders, their price, and how they interact with accounting processes at the construction site and in the home office are all covered in this chapter.

Order sources to change

Change orders may have a number of different reasons or origins. This section elaborates on four of the most prevalent. Errors in design are the main cause of modification orders. They may occur for a number of causes, such as:

The client may contract directly with the engineers (such as mechanical or electrical engineers) and not via the architect if the architect and the engineers do not have enough money, resources, or time to create a comprehensive design. As a consequence, multidisciplinary papers may not be properly coordinated; a difficult undertaking, as building a hospital; or Even professionals like architects, engineers, and project owners make errors. While client-requested modifications to the scope or the programming are among the most costly change orders, they are often simple to complete and get approval for since the project owner wants to add or amend them. An architect-generated construction change authorization (CCA) or construction change directive (CCD) with new or amended drawings and specifications is often included with additional scope revisions. One of the hardest types of modification orders for a client to accept is one that results from the discovery of previously unknown site conditions since it was unexpected or unplanned. They are often the consequence of insufficient site investigation before beginning design. In site work (such as damp or polluted soil) or renovation (such as mould or bug infestation), hidden or latent conflicts or circumstances are frequent and may deplete the client's contingency money early on in the project. The general contractor's (GC's) worksite project team is required to "promptly" tell the architect and client of concealed site problems that negatively affect construction and provide the designer a chance to conduct an inspection. This is often done by using a request for information (RFI). If the goods are not completely coordinated, materials and equipment provided by the project owner for installation by the contractor, or not-in-contract (NIC) equipment, result in a fourth kind of change order. Some consumers of construction think they may avoid paying the general contractor's fee by entering into direct contracts with suppliers and subcontractors. In commercial projects, this is typical for goods like kitchen equipment, swimming pool subcontractors, workout equipment, furniture, special casework, and landscaping. Due to the materials provided by the customer not being coordinated, issues may arise and the project may be delayed. Unfortunately, it often takes until the materials are already on site to identify these conflicts. If the construction team had examined the client's purchase orders and vendor submittals and identified possible problems via requests for information, conflicts may have been reduced. Conflicts with NIC materials may cost project owners significantly more to settle than they would have paid the general contractor to oversee the job initially.

Other reasons for change orders might include the weather, adjustments made by the city when granting the construction permit, material modifications requested by the contractor and supplier, and more. The majority of the development, accounting, and management procedures for change orders will take the same route as those covered in the other sections of this chapter. The drafting and pricing of change order proposals is the first step in the change order process (COPs). Upon approval, the suggestions are formally included into the contract using change orders. To reflect authorised modification orders, cost accounting and cost control systems must be continuously updated. The general contractor and its subcontractors may file claims that call for a formal dispute resolution procedure to settle if the contractor and the project owner cannot agree on change order price and time effects.

Procedure for making change orders

As previously mentioned, there are many ways the change order process might start. As a consequence of a disparity found by the construction team, one typical path is to start with a

request for information, which leads to a cost proposal or request for proposals from subcontractors. The alternative path involves a modification request made by the project owner or architect. In both situations, the general contractor compiles all of the expenses and supporting documentation before sending the client or architect a change order proposal that, if approved, results in a contract change order (CO). In this section, the procedures for processing COPs are covered. Later in this chapter, claims are also presented in a brief manner. Unresolved COPs often result in claims.

A change order proposal is a softer and more negotiable document than a change order, which is a formal vehicle for contract revision. The proposed modification in the scope of work is described in an owner-initiated COP request, which also asks the contractor to estimate any additional or deduction costs. The contractor also asks for more time if the planned modification causes the project's completion date to be extended. A different site situation or a response to a request for information are often the causes of a contractor-initiated COP. Only a formal contract change order may amend the terms of the construction contract; COPs cannot achieve this. In the eResource, there is an extra COP example for altering concrete foundation walls, complete with quantity take-off (QTO) and direct work price summary sheets. 80–90% of the work on a typical commercial building project is performed by subcontractors.

Hence, the bulk of change order proposals are made by subcontractors. Active quality control includes ways for revealing problems, such as well-written requests for information and detailed, on-time submissions. A revised condition should be researched by the project manager (PM) or project engineer/cost engineer before being submitted to the architect. In this instance, the architect anticipated a level four finish and a smooth high-gloss paint that allows for simple cleaning, but the GWB subcontractor processed their submission showing a level three tape finish, including a light texture, which was as specified. The degree of finish was altered by the architect after submission. The subcontractor is required to advise the general contractor of any cost and schedule consequences from the architect's answer if the architect does not seek a change order proposal from the contractor when responding to a request for information or submission. The GC's team will issue a change order price request to the subcontractor if they think a change order is necessary. COPs should be written in a way that makes it easy for the project owner and architect to quickly approve them. Attach any necessary supporting documentation. Subcontractors should provide the general contractor (GC) the same degree of thorough backup that the owner expects from the GC. A record like an equipment ledger, value engineering, or an RFI log should be used to keep track of all COPs. The formal change order procedure is not too complicated if COPs are correctly written by the GC and subcontractors and are approved by the project owner. Yet, concerns about the COP request and the accompanying talks will often arise. This is to be anticipated and is a necessary component of teamwork. Normally, the cost suggestion is negotiable. The project management team is not currently adopting a strict stance. It is a good idea to have a weekly COP meeting in addition to the owner-architect-contractor construction coordination meeting to discuss and resolve change-related concerns. The two approaches used by subcontractors to amend orders, one successful and one less so, are provided below.

CHAPTER 10
CHANGE ORDER PROPOSAL PRICING

[1]Dr. Selvi. S, [2]Babitha B.S.
[1]Associate Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.selvi@cms.ac.in, [2]babitha@cms.ac.in

Change order requests must first be authorized and formally documented in contract change orders before they can be paid for. Being reasonable with pricing on direct and subcontract cost estimates is the simplest method to be paid. Overly high costs will simply slow down the procedure. In general, quantity measurements can be verified and shouldn't be exaggerated. Craft workers are given verifiable wages that shouldn't be artificially inflated. The general contractor should provide the customer the subcontractor bids exactly as they are (unless they are incomplete). The suppliers and subcontractors should follow the same protocols with their second- and third-tier companies. Rates of labour productivity have to be calculated using pre-approved sources. Actual material costs should be stated and supported by invoices or quotations. Any departures from the prior recommendations might harm the parties' ability to work together and create confidence, as well as delay COP approvals. A public estimate database, like one from RS Means, is something that both parties may pre-agree to use when discussing price modifications.

The general contractor will markup the estimate after totaling all direct work and subcontracted work on the change order proposal. Several percentage markups may be included at the bottom of a COP, such as those for labour costs, consumables, minor tools, fees, possibly-applicable general worksite circumstances, contingency, liability insurance, bonds, and others. These cumulative percentage add-ons may have a significant overall impact on the direct cost of the job since they are often cumulative. Some GCs and subcontractors use markups, or percentage add-ons, to increase fees and recoup other indirect expenses. These add-ons often cause customers to lose patience. They don't get why the shift requires them to pay more than just the immediate expenditures. The majority of these markups are necessary, and sometimes it's simply the way they're presented that makes them difficult to accept. Calculating the precise effect of each item is an alternate strategy, but it may be challenging for the contractor to account for and the project owner to comprehend and approve.

The chief executive and financial officers of the home office regularly monitor home office overhead and profit, or fee, which is a very significant cost addition that is covered throughout this book. Commercial general contractors' fees will be marked up by 3-7%. Fees for civil, residential, and small-scale commercial projects may reach 10%. The contract will normally indicate or permit this rate, which is typically the same percentage charge that was applied to the first estimate. There was no deduction of fee for reductions in scope, which is often the case, unless there is a major scope change, such as the elimination of a parking garage floor. Evergreen Construction Company (ECC) and Northwest Resorts (NWR) agreed to a 7% fee markup for additive direct work and 3% for subcontracted work and inserted that into their A102 contract, Article 5.1.2. Most speaking, general contractors' fees for home office overhead do not come with a specific add-on for GCs.

However, the majority of construction contracts do not permit the general contractor to add extra worksite general conditions to change orders. The exception is that certain job-site general conditions line items may be permitted if a time extension can be shown. The worksite project team must provide evidence to support the time and expenses, such as a very comprehensive construction plan, in order to demonstrate that more general conditions and/or time are justified. The owner often views contractor requests for reimbursement for extra worksite general conditions, time extensions, home office general conditions, and/or impact expenses as controversial and generally rejects them in the change order proposal process, which might lead to a contract claim. 5 discussed the creation and administration of worksite general conditions estimates. Due to their lower volume of work and greater direct labour proportion, specialty contractors may charge a larger price on change orders than would a general contractor. Even on modified orders, direct labour is an estimation risk for subcontractors. It's possible for subcontractors to get a 10% charge plus an extra 10% for overhead. How many additional markup elements are added to or subtracted from the fee and overhead markup will determine the fee and overhead rates that may be applied to change orders. All of this should be defined in the contract.

discussions and authorizations

When a construction contract has to be changed after it has been signed, a formal contract change order is used. Typically, the architect is the one who creates the contract change order. A contract change order is issued to amend the terms of the contract if the architect, the client, and the general contractor have worked out a mutually agreeable modification in the contract price, timeline, or both. Most prime contracts' supplementary or special specifications include the change order processes. Many contractors, customers, and architects use ConsensusDocs form 202 and AIA document G701 as official change order coversheets. The Olympic Hotel and Resort case study project's owner, Northwest Resorts, a holding company for Resorts International, constructs and operates hotels throughout the nation, hence they have their own unique formal contract modification order form.

For either a single major change order proposal or a collection of COPs, a formal contract change order may be employed. Some customers want to publish formal change orders every month that include all COPs that were authorised during the previous month. If the change order is completed before the monthly pay request is generated, enabling the CO to be charged this month, this procedure is advantageous for the general contractor. COPs do not affect the contract's terms and are not included to the schedule of values for payment until a formal contract modification order incorporates them. The construction team places a high priority on expediting the official contract change order since often the contract does not permit payment of COPs until they are properly integrated into the contract and appended to the pay request SOV. Any scope adjustments included in each change order should be included in the contract documentation. The official change order should be processed by the project manager, who should get the architect's and the project client's signatures of approval. The scope, cost, and timeline of the contract have been changed after the architect, client, and contractor have all signed the change order. The COP and formal contract change order often include language indicating that after the general contractor (GC) has signed, they agree with the adjustment in price and time and will not make another claim for this scope. Similar terminology will be used by the GC when making adjustments to subcontractors and suppliers.

Including in systems for accounting and cost control

The project manager or cost engineer will amend the relevant subcontracts and purchase orders for the primary material suppliers once the general contractor's contract has been

changed. The procedure for the subcontractors and suppliers to seek payment for the revisions may then start. The project manager will create journal entries to the cost accounting system after the formal contract change order has been executed, changing the percentage markups for insurance and fees as well as the total contract value and adjusting individual estimate line items to reflect approved changes in scope. Journal entries will be used to make these adjustments to the home office accounting system; these entries are often started by the worksite cost accountant and approved by the PM. Unlike adjustments made to the cost control system during the early estimate correction stage of the cost control cycle, these journal entries do not need to "balance," as did those changes. The sum of the accepted change orders should be the net impact. The cost engineer will collaborate with the foremen to build work packages and assign new cost codes to the expanded scope. It is crucial that only actual expenses be charged to those cost codes if the adjustments are being made on a time and material basis. The construction team may harm relationships if there is incorrect coding since the client believes the contractor to be fair while conducting work T&M. The on-site owner's representative may actually initial on time sheets and material bills connected to change orders in certain significant open-book projects. In certain cases, the contract may permit the customer to instruct the contractor to continue either on a time and materials basis or on a pricing basis that is "to be negotiated" basis if the parties are unable to reach an agreement before the work begins. It's critical that the expenditures be appropriately monitored in both scenarios. As the superintendent records the number of workers on site, work completed, goods supplied, and equipment used, certain expenditures are also accidentally tracked unintentionally. The equipment ledger will keep note of whether new equipment was used under different circumstances. Change orders may be added to the pay request process using one of two techniques. Before the start of the project, a schedule of values had been created and accepted. After modifications are accepted, each line item impacted by them may be changed on a monthly basis. Keeping track of the initial estimate and reconciling bills for original scopes and altered scopes is a challenge with this system. The alternative method is adding line items to the SOV's bottom that indicate authorised contract amendments and immediately invoice for them. The difficulty in tracking the updated subcontract and purchase order amounts and matching monthly bills with lien releases is the method's main drawback. In regard to the Olympic Hotel case study, Evergreen Construction Company used the second strategy in its SOV and monthly bills to Northwest Resorts.

Pending change orders

Some people consider all change orders to be "claims," however claims and formal contract change orders are not always the same thing. Disputes often result from a COP that the customer rejected or from additional scope that was imposed on the contractor. Late in the building phase, when contractors have recognised they did not meet their planned estimate or time, several claims are made. As a result, the contract will include deadlines for filing claims, such as within 21 days following the incident. A claim's value is often substantially higher than a COP. For the Olympic Hotel case study project, the contractor may submit a claim for $350,000 or more owing to a two-month time delay brought on by the owner or an extremely cold winter, while the COP might be for $3,000 for a modification to hotel room signage. The verification of real expenses expended is crucial to claim compensation. It is difficult to argue against "real" costs on altered circumstances vs "anticipated" costs, and the cost engineer achieves this by using precise cost coding and recordkeeping.

The primary contract agreement outlines the process for resolving disputes. The least costly and fastest answer is preventive, which calls for all parties to be vigilant in their contacts and deal with problems as soon as they arise, ideally at the worksite, to avoid having to escalate

them back to the home office. In the event of a dispute, the parties are urged to discuss a resolution, including on the worksite. The chosen less costly route is the change order proposal procedure that was previously explained. If a modification cannot be agreed upon by the parties at the project level, the claim settlement procedure will likely include mediation, dispute resolution boards (DRB), arbitration, and litigation, from least to most expensive and time-consuming. While claims and dispute settlement are not directly related to cost accounting, solid accounting processes may help with successful claim resolution or claim avoidance.

Change orders are a regular occurrence throughout practically every project's construction phase. Changes must be handled by the job-site management team—which includes the owner, architect, and general contractor—in the quickest and most equi way feasible. Change orders may result from a number of things, such as conflicting design papers, scope extensions, different site circumstances, and equipment that is not covered by the contract. Proposals for change orders may be started by the customer or the GC. An owner-initiated proposal asks the project team to assess the effect on costs and timeline. A proposal submitted by the general contractor (GC) or a subcontractor outlines the planned modification in the scope of work and asks for an accep recalculation of the contract price and/or time. The project team keeps track of all COPs, whether they were created by the customer, general contractor, or subcontractors, in a COP log. A formal change order is issued to alter the contract when the GC and the client have worked out an adjustment in the contract price and time that is mutually accep. In contrast to a COP or contract change order, a claim is a contractor's request for time and/or money that the client hasn't yet agreed to accept. Claims are handled in accordance with the prime contract agreement's specified dispute resolution procedure. Fair pricing, thorough open-book accounting, prompt communication between the parties, and effective worksite bookkeeping are the most effective ways to handle and get permission for modification orders.

Completion of the building project's finances

Contractors enter a close-out phase as physical completion of building projects approaches. To organise the many tasks required to finish the work, the jobsite team should create a project close-out plan. Good close-out processes are vital to timely fulfilment of contractual obligations and collection of final payment, just as start-up activities are required when work on a project is first started. Effective project close-out is advantageous for both the general contractor (GC) and the customer. Every contractor wants to finish a work fast and move on to the next one. As it reduces expenses associated with worksite general circumstances and makes it easier to receive final payment and release retention on time, shortening the period of close-out operations typically increases profit. Minimizing the contractor's interference with the client's move-in and start-up operations is another benefit of effective close-out and transition processes. Slow close-out procedures may lead contractors to lose customer connections and harm their image in the industry. In order to close off a project contractually, all physical construction work must be finished and all paperwork must be assembled. The terms for significant completion and final payment will be outlined in the contract between the main customer and GC. The close-out procedures necessary to handle final payments are described in Article 12.2 of the AIA A102 contract that was used for the hotel case study. In general, superintendents are in charge of completing construction field work and physically wrapping up the project. The paper close-out, including all related financial and accounting issues, is the project manager's (PM) responsibility with the aid of the worksite cost engineer. The execution of close-out features, such as construction close-out, project management close-out, financial close-out, and as-built estimates, are covered in this chapter.

Closure of the construction

The project superintendent is in charge of carrying out the necessary tasks to finish building and close out the project's physical components. Complete construction in accordance with contract requirements; Punch list walkthroughs, documentation, and resolution of outstanding items; Start-up, commissioning, and training; Certificates of Substantial Completion and Occupancy; Client Move-in; and physically departing the jobsite, or demobilisation, are just a few of the physical construction close-out activities. As part of an ongoing quality control programme, the jobsite crew, led by the superintendent, regularly inspects finished work and notes deficiencies while the project is being built. One of the methods a general contractor will use to cut down on the size of the final punch list and ultimately save money for all parties is in-process punch lists. The GC asks the owner and architect for a walkthrough inspection when the project is almost finished. The punch list, also known as a formal punch list, is a list of deficiencies found during this examination. While the architect typically creates the punch list, some clients create their own. Punch lists may also be created by certain members of the consult- ant design team, such as mechanical or electrical engineers. The ideal approach is for all stakeholders interested in inspecting the project to get together, tour the worksite simultaneously, and create a formal punch list.

The formal punch list walkthrough must be timed carefully. Although it shouldn't be too early to mix up repairs of finished work with base contract work that hasn't been completed, it should be early enough to provide time for rectification. Further damage that wasn't included on the first punch list could be experienced if there are still fundamental building tasks left undone, necessitating adjustments. In contrast, it is difficult to pinpoint who caused what harm if the project team waits until after the customer has moved in to create the punch list. All of the work on the punch list should be completed by the general contractor in no more than one month. Before the project can be fully completed, every item on the punch list has to be fixed. The subcontractors may have demobilised if the procedure takes too long, and it could be difficult to mobilise them again on the construction. Once issues are fixed, each subcontractor and the general contractor (GC) should check off the punch list. To the architect should be supplied a copy of the finished punch list. The architect may then decide to revisit each item on the punch list to confirm that it has been completed or conduct spot-check audits. The architect then creates the certificate of significant completion.

Prior to handing over the finished project to the customer and their facility maintenance staff, all mechanical, electrical, and plumbing (MEP) systems and equipment must be started and tested to ensure they are operating correctly. The MEP subcontractors often focus on testing and are required to adhere to both the specifications and the rules set out by equipment manufacturers. These tests are arranged together with the customer, the GC's supervisor, and often the design engineers. A test certificate will then be prepared and signed by everyone in attendance. The operation and maintenance (O&M) manuals, which are covered in more detail later, then often contain these reports. Moreover, the heating, ventilation, and air conditioning (HVAC) systems must be balanced, sometimes by a neutral third party. Nowadays, a lot of projects are also commissioned, either by the customer, the contractor, or once again by an unaffiliated third party. The O&M manuals will also include all of these commissioning and balancing reports for the HVAC system. The architect, or engineer in the case of a heavy-civil project, issues the certificate of significant completion. This significant certificate certifies that the project is substantially complete, meaning there may still be some minor issues that need to be resolved before it can be utilised for its intended purpose. Even though not every item on the punch list has been fixed, the architect agrees that the project is now ready for usage. Attached to this certificate should be a copy of the modified or corrected punch list. The time by which significant completion is attained is known as

contractual completion. The warranty term begins when the significant completion certificate is issued, which also marks the end of the general contractor's (GC) responsibility for liquidated damages (LDs).

The certificate of occupancy is issued by the authority having jurisdiction (AHJ) over the project site, which is most likely the City, County, State, or Federal Government (C of O). The first construction permission was obtained by this organisation. The C of O certifies that all code-related concerns have been addressed, the building is authorised, and it is safe to occupy. After the conclusion of the inspections, all additional building permits are typically approved and signed off as a formality. The fire marshal's examination and approval for life-safety problems, together with the elevator inspection, are often the most important components of the certificate of occupancy. Even if the project has small flaws unrelated to life safety, it may still be given occupancy approval. For instance, even if one window blind in hotel room # 405 may not yet be fitted or fixed, it is safe in terms of life safety, and the rest of the hotel is still useable and constructed in accordance with code. A temporary certificate of occupancy (TCO), which certain governmental agencies may grant, permits the client conditional use of the facility for a specified time, say six months, while additional non-critical work like exercise equipment for the leisure area or some interior finishes may be finished later. The jobsite crew for the general contractor must acquire both certificates of completion in order to achieve contractual close-out.

The majority of project owners are eager to move into their new developments as soon as the relevant authorities approves their occupancy. When the customer accepts and uses a piece of the building while the contractor is still working in another, this is known as joint occupation. This can be required if the customer has to start doing business in the new space, have a conference, or start bringing furniture and other items in. Inappropriate management of joint, dual, or conditional occupancies may make them unattractive. The project team may struggle to distinguish between cleaning and normal maintenance performed by the client and construction punch list and warranty work. Delaying occupancy until both certificates of completion have been received and all issues on the punch list have been resolved is best for all parties. If the GC and the client are to share occupancy, they must cooperate to build processes for realising each other's objectives; all of this must be included in the contract. Commercial estimators seldom ever include a line item for mobilisation or demobilisation in their initial estimates. Demobilizing, or leaving the site physically, requires a lot of labour and may be costly, particularly for the general contractor. A foreman and a small staff to clean up the site may not be able to be funded at that time. Whose trash and excess materials are left invariably becomes a point of contention between the GC and its subcontractors. Similar to the topic surrounding shared occupancy, when the customer is also moving in, rubbish buildup may mingle between the construction staff and the client. Closing the project office and physically removing all tools, materials, and staff that belong to the contractor are also parts of demobilisation.

Project closure management

The project management team reviews the contract and specifications for close-out needs during the project start-up phase to get a head start on close-out. Ideally, this occurs early enough such that each subcontract agreement and large purchase order specifies the close-out criteria. Making a list of what they believe needs to be done, the project management (PM) or project engineer (PE) should next request confirmation from the design team. As-built drawings, operation and maintenance manuals, test results, additional finish materials, and permits that have been approved by the appropriate authorities are just a few of the significant things the project team will present throughout the close-out procedure.

Actual measurements and conditions of the installed work are indicated on the contract drawings throughout the building process. As a result, these drawings should be more accurate than the original design drawings since they reflect the as-built circumstances. The as-built drawings from the subcontractors should all be gathered by the project manager and onsite project engineer. For civil, architectural, and structural work, the general contractor creates as-built drawings; MEP subcontractors generate and submit their own as-built drawings to the GC's PE. Mechanical, electrical, plumbing, and civil installations are crucial because they include concealed systems that may be accessible during a redesign or that, if severed, would result in significant harm. The best project team member to mark up the as-built drawings is the foreman or assistant superintendent who supervised construction. The same processes used to submit shop drawings should be used to submit the as-built drawings to the customer or designer. Contractors may be required to electronically record as-built conditions for many projects where the architectural and engineering teams used building information modelling or computer-aided design. If electronic as-built drawings are necessary, the general contractor's worksite crew and general conditions estimate may be increased by a professional project engineer.

Manufacturers' information on operational, preventative maintenance, cleaning, and repair methods for all equipment as well as numerous architectural finish materials is gathered from operation and maintenance manuals. For the client's permanent service record, this data should be gathered from all subcontractors and suppliers and arranged in many sets of three-ring binders. The structure and organisation of O&M manuals will be specified in the contract specifications. Processing the O&M manuals as a submission and requesting architect approval is an accep method. This is often necessary and is always a smart move. Before submitting the final copy, some designers may ask for comments on draught versions. The O&M manuals could also need to be supplied electronically, like the as-built drawings we spoke about before. Materials and systems are set up and tested during the building process, and test reports record the outcomes. For the mechanical systems, this comprises balance and commissioning reports. These test results might all be bundled into one part of the O&M manuals. The final compilation of the O&M manuals and the gathering and filing of these reports will be assisted by the project engineer. The customer must be given any additional material amounts, say 1% to 3% of different architectural materials, according to the specifications. Materials like paint (in each hue used), ceramic tile, carpet, and ceiling tile would fall under this category. The customer may use this in the future for renovations and repairs. Contractors incur the risk of running out of supplies at the time of turnover since construction workers may use up these items inadvertently for punch list or change order work. Excess finish supplies must to be maintained in safe storage or given to the customer as soon as they are acquired. Several subcontractors had to apply for and get their own construction licences from the relevant government. Businesses like electrical, elevator, and fire protection contractors are often included in this. These permits must also have the AHJ's approval after completion. This shows that the subcontractor's work complied with all applicable code standards. Similar to other close-out paperwork, signed-off permits may also be included as a part in the operation and maintenance manuals. The interim inspection reports or signature cards obtained from the city or county during the course of construction may also be required to be submitted to the designer or included in the O&M manuals by the worksite management team. A close-out log should include each of these things.

Monetary close-out

A project's financial close-out is not the chief financial officer's (CFO's) or officer-in-(charge's OIC's) duty. The project manager for the general contractor is in charge of concluding the project's financial arrangements with the customer and any subcontractors,

although he or she may also seek the support of senior management and the worksite cost engineer. The ultimate objective of the GC is to get its retention, and all matters pertaining to concluding the project financially are required before the customer will write the final retention check. Final change orders, final payment requests, client audits, final lien releases, final fee forecasts, and other things are some of the things that are included in the financial close-out of a project.

Sequence of final changes

Final change orders with the customer are negotiated as part of the financial close-out for the general contractor's project manager. The customer wants to guarantee that modification orders won't keep coming in even after they've acknowledged the project's completion and approved it for usage. It is now necessary to settle any change orders that may have been refused or d in the past. As was covered in the preceding chapter, unresolved change orders often develop into claims. The customer should ask the GC for a final change order, even if it costs $0, with the word "FINAL" displayed prominently at the top. Before the project manager for the general contractor can assure his or her customer that there won't be any more change orders, they must "shake the tree" and make sure that none of their suppliers or subcontractors have any outstanding pricing difficulties as well. Assuring that all of the subcontractors and suppliers on a typical commercial construction project are happy and won't be filing a hidden modification request or claim is a challenging financial close-out chore. The GC should demand the same level of performance from its subcontractors as the customer does of them in all aspects of risk management. The GC's PM and cost engineer should, in this instance, send FINAL subcontract and purchase order modifications to their suppliers and subcontractors that include all outstanding change problems and back charges, even if they are once again written for $0.00. An illustration of a final modification order for Evergreen's

Demands for final payments

A request for final payment will be made by the general contractor to the customer. Some GC project managers may include their request for retention with their request for the previous month's progress payment. If the customer is willing to pay the agreed-upon sum and is satisfied with the quality of the work delivered in the previous month but is not yet prepared to release the general contractor's retention, this might become problematic. The customer may withhold the whole amount if the two problems are bundled into a single request and have a single lien release with the combined totals. The GC and its subcontractors will experience financial difficulty as a consequence of this. Even if the two are delivered to the customer simultaneously, it is advised to create two distinct requests for payment: one for the last month of work and one for release of retention. Invoice #17 won't be submitted until all of the other project management and financial close-out tasks covered in this have been completed, which is an advantage for the general contractor and its subcontractors in Example Two. They can now receive $475,000 to use for direct materials and labour payment, hopefully within ten days of invoice submission. The project manager and cost engineer of the general contractor must first receive final pay requests from subcontractors before they can prepare the final request for payment. This may be a difficult process, similar to the discussion of final modification orders before. The customer should request that the term "FINAL" be prominently displayed on the pay application, and the general contractor (GC) should follow suit with its suppliers and subcontractors. The project team of the GC should swiftly distribute payments to subcontractors upon receipt of payment from the customer. Final lien releases from all of the GC's suppliers and preparation of the same for the customer, as detailed below, will accompany the pay request procedure.

Audits

The topic of impending lump sum projects is taxes and audits. As these projects are closed-book, customers cannot examine the contractor's books; nevertheless, there may be contract wording that permits this. However, this is the exception rather than the norm. The client or its representative may be required to verify the contractor's cost accounting for change orders that are allowed on a time and materials (T&M) basis, but only for that specific change order. Open-book negotiated projects are often subject to a client-led final audit. The Olympic Hotel and Resort case study project was contracted out to Evergreen Construction Company (ECC) by Northwest Resorts, LLC (NWR) on a negotiated basis with a guaranteed maximum price (GMP) of $24.5 million. NWR will typically audit the contractor's books at the end of the project, when ECC is getting ready to ask for release of their retention, to make sure that the contractor actually spent what they say they did and only billed costs to the project that were agreed to be reimbursable as defined in the contract. NWR won't release ECC's retention, or at least not all of it, until its auditor (whether an internal or external certified public accountant) submits an approved report. The GC may also audit the subcontractors' books, again before the client's audit, if the general contractor has engaged open-book subcontractors, such as design-build mechanical, electrical, and plumbing. If the contractor is a signatory to labour unions, the unions may also audit the contractor's records to ensure that the contractor has paid its fair share of worker benefits, although this normally happens once a year rather than on a project-by-project basis. Again, a savvy client can ask the unions to give affidavits attesting to the fact that their benefits have been paid so far, particularly in relation to their project as the unions have the legal power to lien the project if underpaid. The operation and maintenance manuals could include a separate section for these union affidavits.

Final Discharges of Liens

The final change order and final pay request procedures rely on a number of additional prerequisites, all of which must take place concurrently. In a way, this is a "chicken and egg" situation. The procedure for releasing the last lien is essentially similar. One thing cannot happen until the other is settled, and the second thing is awaiting the resolution of the first. 14, "Payment Requests," detailed monthly conditional lien releases. The customer is asking for a Definitive or unconditional lien release from the general contractor at the conclusion of the project. The conditional releases effectively state that: The GC will waive its right to encumber the project with a lien for the precise amount specified under the condition that the customer pays the GC the specified sum of money within the specified time frame. After that sum has been paid, the customer is subsequently shielded against liens. The GC has been paid and now entirely and absolutely releases its right to lien for the amount received, according to an unconditional lien release.

The owner will not release the retention of the general contractor until all close-out requirements covered in this chapter, including this final lien release, have been satisfied. The GC is safeguarded throughout the project since they are aware that they will inevitably get one or more pay demands, which means they haven't totally relinquished their lien rights. Yet after the final lien discharge, this is not the case. Notwithstanding the fact that the retention has not yet been paid, the client is essentially requesting an unconditional release. This author/project manager has concurrently exchanged multiple unconditional lien releases for the retention check with the customer. Lien releases might involve complicated legal terminology and are frequently written by lawyers. Contractors should consult with their legal counsel before agreeing to sign a client’s lien release form. The general contractor’s project manager again lays the same obligation on the subcontractors that the customer has

placed on him or her. The GC should not issue the client with an unconditional lien release until it has obtained all of the final lien releases from all of its subcontractors, including their subcontractors. The GC should look as far back as they can to confirm that third-tier subcontractors and their suppliers have all been paid.

Experienced owner's representatives will also request that the GC include the subcontractor lien releases in the operation and maintenance manuals in addition to its own lien release.

Keeping and releasing

The general contractor's and their subcontractors' ultimate objective is the release of retention. Retention used to be equal to 10% of the cost of the job, as indicated, but is now often 5%, which is roughly equivalent to a contractor's fee. The contractor has not been paid its fee until the issue has been settled. Yet, general contractors that outsource the bulk of the job will also have kept a similar proportion of retention from their subcontractors as the customer did from them. As a result, the GC has been paid in part of its fee; the only balance due is the retention kept for their direct labour, material, equipment, and other charges. Just 5% of the indirect labour used by at-risk construction managers who subcontract out the whole project is retained. Due to their monthly pay requests being fulfilled on a pay-when-paid basis and retention being held, the subcontractors are assisting the customer in financing the project. Subcontractors in the third rung are considerably more affected. Before the retention is released, every subject covered in this must be fully finished. Release of retention may be delayed by any one thing. Construction close-out processes like the punch list and completion certificates come first in this. As-built drawings, operation and maintenance manuals, among other documents, must all be collected and given to the architect and the client as part of the project management paper close-out operations. The project manager will get assistance from the worksite cost accountant in executing a number of highly crucial financial close-out tasks, including processing final change orders, final pay requests, and final lien releases. As was mentioned before, a separate check should be used for the actual release of retention. It's a significant occasion for the general contractor. Upon receipt, the GC should ensure that all close-out operations of its subcontractors have been completed and shall pay such subcontractors promptly. The GC depends on the subcontractors' financial stability to not only see them through this project, but also to remain afloat and be able to provide them a competitive bid on the next one.

Accounting and administration of warranties

The warranty period is a last stage that comes after all other stages of construction, such as the close-out phase, have been finished. The length of the project's warranty, which is typically one year, will be specified in the specifications and the contract. The roof is guaranteed for 20 years, and the elevator is warranted for 5 years, among other extended warranties on building equipment and systems. The general contractor will spend money during the first year of the warranty dealing to warranty call-backs, which may include anything from leaky faucets to drywall cracks to dead landscaping. It is crucial for the GC and its subcontractors to act swiftly and fix any errors if they want to maintain a long-term relationship with the customer. As was said at the beginning of this chapter, warranty management is comparable to badly closed out projects in that it may affect a contractor's reputation. The contractor may have included a little quantity of money in its estimate for the general conditions of the worksite during the warranty term for lump sum projects. While the general contractor often relies on subcontractors to assume the most of the risk for warranty call-backs, the GC is still responsible for overseeing the procedure. The GC may raise their price if they spent less than they were authorized to. In the same way that a protracted close-out period would eat into the cost, they will consume their fee if they exceed their warranty

limit. The contractor will also have a general conditions line item for warranties on negotiated open-book projects. According to the extended general conditions estimate on the eResource, Evergreen Construction Company includes $10,400 for warranty repairs. The amount of money in that line item will be discussed during the final audit. If there is still money put aside for warranties, can the general contractor actually close off the project completely? There may not be a problem if that sum of money is exactly appropriate. But, if money is still available beyond the warranty time, it should go to the customer; once again, contract and savings split concerns would govern this. If the contractor needs more money than anticipated, the customer may have have received additional savings from the close-out financial audit, which would be needed to make up the difference. The customer has been well-protected against cost overruns in open-book negotiated projects with a predetermined maximum price, but line-item over- and under-runs within the contract are to be anticipated and are accessible for the contractor to control. Hence, if the contractor under-ran the line item for doors and hardware by $9,200 but over-ran the line item for waterproofing by $8,800, the two would almost equal out. This also applies to warranty estimates. The owner does not want the contractor to make a windfall profit if they under-ran that estimate either, but neither does the contractor want to take a chance on a warranty cost overrun. The contractor usually agrees to monitor such costs separately as an allowance, and if there is a significant over- or under-cost event that can be supported by time sheets for labour and material bills, the two will agree to settle it a year after close-out.

Final fee forecast

The project manager and cost engineer must conduct a final cost and fee projection after receiving the last monthly pay request and retention checks and paying all of the subcontractors. The project manager (PM) forecasted the project's final charge with each of the monthly predictions. The PM should become more precise and certain in his or her projections as the project advances through buyout and into the direct labour stage of the project. To add up to a total revenue prediction for the company for the fiscal year, the OIC and CFO depend on accurate projections from each project. The front office will not be happy if Evergreen's PM had been predicting a price of $1.2 million for 15 months, but at the conclusion of the project, surprised them with a final fee of $900,000. In contrast, even if the front office would be happier than in the previous scenario if the PM's projection was unduly gloomy and the project came in with a final charge of $1.6 million, they would not be happy. For the purpose of negotiating bonding and banking resources as well as reporting to equity partners, consistent income estimates are employed.

The home office may have taken alternative business choices, like boosting bonding capacity and obtaining more work, or leveraging their equity to buy more equipment or enter a new market, had they known the project would come in with a higher charge. The PM's monthly projections aren't expected to be spot-on from month to month by the home office; in fact, if they were, one could ask whether the PM was underestimating the fee estimate. Differences are permitted as long as they can be managed and explained by the worksite team. An internal lessons-learned report created by the project team is another close-out component that is often related to the final fee prediction. This is a helpful tool that may aid in better preparing people and the business for future projects, which may include the same customer or architect or involve work of a similar kind. A self-diagnosis of "what worked, what didn't, and why, and what we can do better on the next project" is essentially what the lessons-learned report is. An evaluation of the GC's suppliers and subcontractors is a potent supplement to that report. A transparent report card on subcontractor performance might be useful for other PMs and staff experts like estimators and procurement specialists.

Creation of the as-built estimate and database input

The as-built estimate should be kept up to date throughout construction or created close to project completion, but not months after close-out. The real expense tracking took a lot of labour. This is important information for the building company's continual efforts to raise the accuracy of its estimates. If the estimating database is to be maintained up to date, the as-built estimate must be entered. The majority of project managers or worksite cost engineers will simply add real costs together with the original amounts to the business' database.

To consider the project contractually finished, all construction work must be finished, as well as all needed documents being prepared and submitted. In order to guarantee that close-out processes are thorough and effective, the project manager, cost engineer or cost accountant, and superintendent collaborate closely. Effective close-out processes often lead to increased contractor profits and happy customers. The superintendent is in charge of seeing that construction is physically finished, while the PM and cost engineer are in charge of managing close-out paperwork and financial close-out. The general contractor will arrange for the client and design team to participate in a formal punch list walkthrough as the project gets closer to completion. Any shortcomings found are added to the punch list for a subsequent re-inspection. Before the contract can be closed out, all issues on the official punch list must be fixed. Achieving substantial completion, which shows that the project may be utilised for its intended purpose, is a significant project milestone. A certificate of substantial completion is issued by the architect once he or she determines that the project is essentially finished. But, the customer cannot occupy their new project unless the City has also given a certificate of occupancy. The project's financial and contractual close-out is the responsibility of the general contractor's project manager, who has the assistance of the firm's cost engineer. Subcontractors and significant material suppliers must get final modification orders, and their unconditional lien releases must be obtained. It is necessary to put together as-built drawings, operation and maintenance manuals, warranties, and test results. Early on in the project, the project manager or project engineer should create a close-out log to oversee the timely submission of all close-out documentation. After all project operations are finished successfully, the contractor is given their final payment and release of retention, which often matches their price. Effective close-out procedures safeguard the contractor's fee rather than increasing it since the expense of prolonged general conditions has a tendency of gradually diminishing charge.

An accurate as-built estimate is created by combining actual installed quantities, actual man-hours, and actual material prices. The as-built estimate line items should also use the cost codes that were allocated during the first estimate and used throughout the cost management process. As-built estimates may be created by the project cost engineer, but the staff estimator should insert them into the contractor's estimating database. Very high and low prices should be scrutinized to prevent them from distorting the average. Yet, no project is really typical; each has its own unique qualities. Because of this, the price range should be examined to identify a project with features comparable to the one that is being bid.

CHAPTER 11
TIME VALUE OF MONEY

[1]Dr. Shalini. R, [2]R Thanga Kumar
[1]Associate Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]dr.shalinir@cms.ac.in, [2]thanga@cms.ac.in

The benefit of having a certain amount of money now is higher than the benefit of having the same amount of money in the future, which is the fundamental definition of the temporal value of money (TVM) idea. A healthy cash flow for contractors is crucial, and this is strengthened through fair and timely pay requests as well as negotiating and receiving payment for modification orders. TVM connects these two concepts. Popular topics in engineering economics include TVM. This is an issue in advanced cost accounting and financial management that is more relevant to chief executive officers (CEO) and chief financial officers (CFO) than it is to projects. The jobsite team must understand that "money costs money" and that if a contractor needs to borrow money from a bank to pay their monthly labour and material invoices, they will be operating with a negative cash flow, or "in the red." This topic is very relevant to project managers (PMs) and cost engineers. A general contractor (GC) would not typically include the cost of a construction loan in their estimate. Looking back to the worksite general conditions estimate from and the extended blank general conditions template from the resource will confirm this. A line item for a construction financing does not exist.

The contractor has no plans to finance the project on behalf of its customer. A PM will soon get a call or visit from the CFO if they are operating in the red and have a negative cash flow. In contrast to smaller, quicker initiatives, bigger, longer-lasting building projects are more appropriate for a TVM application. While these financial concepts are sometimes used interchangeably, their definitions differ somewhat, especially in relation to TVM.

The idea of "equivalence" is a key tenet of the time value of money theory. Studying TVM enables as financial equal a review of past, present, and future investments. Non-quantitative factors like desires, wishes, and personal preferences are not taken into account by TVM. The present value, future value, interest, inflation, and other value issues will all be covered in this chapter. Our two next advanced cost engineering chapters on taxes and real estate development also touch on the cost of money. When evaluating their present and prospective investments, businesses and people benefit from having a working knowledge of TVM.

Simply put, interest is what you pay for money. The existence of a time value of money research is explained by interest. Interest is the fee one party charges another for the use of their funds. The bank will provide you interest, say 2%, for using your funds when you deposit money into a savings account. Thereafter, they lend your money to your neighbour, who is then charged 4% to use "their" money. Bank and investor interest rates are influenced by a variety of variables, such as market rates, the borrower's risk, the Federal Reserve Bank's (FED) interest rate, the borrower's planned use for the money, alternative investment options, inflation, and others. The risk element and likelihood of bankruptcy of a developer or contractor, as assessed by the lender, will influence the interest rate. Simple interest rate, compounding interest rate, effective interest rate, nominal interest rate, annual percentage rate

(APR), annual percentage yield (APY), adjus rate mortgage (ARM), variable payment rate, and other methods are only a few of the various ways to look at interest rates.

Borrowers would be perplexed if they believed they had agreed to a 7% home mortgage interest rate but really ended up paying about 7.5% since they were being charged interest on top of interest by the bank because comprehending interest is not always 'simple,' Compound interest is what is happening here. The Truth in Lending Act, approved by Congress in 1968, mandates that lending institutions disclose the total yearly rate that borrowers would be required to pay.

Inflation: Many financial studies take inflation into account, and although many economists devote their whole professional lives to generating these forecasts, it is not a perfect science since no one 'knows' with certainty what the inflation rate will be in the next year. Generally speaking, inflation indicates that prices will rise in the future. Inflation gradually and consistently reduces a consumer's buying power. To prevent excessive interest and inflation rate increases, the US Treasury and FED aim to stabilise the economy. reflects the United States' historical inflation rates over the last few decades. During the 1980s, when inflation rates exceeded 12%, the rate of inflation has significantly stabilised.

As indicated in the following equations, interest may be replaced by inflation (f) variables in our current value and future value equations. As was previously covered with PV and FV, each of these variables may be resolved for individually. The impact of interest is diminished by inflation. If the savings account certificate of deposit your grandmother gave you for graduating from college earned 2% interest but inflation is 3%, keeping it in the bank would result in a loss.

It may be challenging for project owners and contractors to account for inflation in construction estimates. Contractors that add an inflation factor to a competitive lump sum bid project are unlikely to win since their rivals will either have not included one or have added a lesser inflation factor. Contractors often include a provision in a negotiated contract shielding them from increases in labour and material costs and shifting that risk to the project owners. Inflation exclusion provisions are rarely well received by project owners, and attempts by contractors to alter orders for price increases brought on by inflation sometimes result in claims or project disputes. Contract language like "adjusted for inflation" is a popular way for buyers and sellers to reduce risk across many facets of life, not just the building industry.

Banks will provide a borrower with a fixed 30-year mortgage at a 5% interest rate so that the homeowner will consistently make the same payment (with a varied ratio of principal and interest payments) throughout the loan's term. Nevertheless, a 4% adjus rate mortgage may also be available. This mortgage may be "adjusted for inflation," allowing the bank to gradually raise the interest rate, often with a limit of 2% over the starting rate.

The importance of additional factors

Project managers, cost engineers, and CFOs may all benefit from learning about cost accounting and financial management. The current value and future worth of money have been the main topics of this chapter. We briefly discuss a few more value factors in this part, many of which are related to earlier chapters in this book that discussed cash flow, pay requests, and change orders as well as forthcoming advanced chapters on taxes and pro forma. The concept of economy of scale is comparable to an analysis of declining marginal returns in economics; the first scoop of ice cream was fantastic, but not necessarily the fourth. For instance, it costs much more to construct a small boutique hotel with 30 rooms over two floors than a larger hotel with 120 rooms over five stories. If the fixed expenses of an elevator, restaurant, and swimming pool were taken into account and both the two-story and

five-story hotels featured these amenities, the construction unit pricing cost would increase when calculated on the number of hotel rooms. The use of unit pricing to concrete, doors, and other direct work items must take into account economies of scale. Placing 10 cubic yards (CY) of concrete in one day vs 100 CY costs substantially more per CY. This also readily applies to the number of garage stalls; the more the numbers, the less expensive the unit costs are.

An extra restaurant, an additional elevator, or in the case of a parking garage, an additional subterranean floor, would eventually be needed for a bigger hotel concept. These significant additions involve gradual cost increases. This idea is comparable to the discussion of fixed and variable overhead expenses. When increasing a starting investment, an investor must take sunk expenses into account. The initial investment is lost and cannot be retrieved after it has been "sunk." The capacity of the investor to recoup their original investment may be improved with further investments, but this is not a given. To prevent "pouring good money after bad," an investor, especially a real estate developer, may be forced to consider abandoning their initial investment. Payback, often known as the cost recovery time, is another well-known financial term. An investor will invest in a building if the energy and utility cost savings that emerge from it will pay for the investment in a certain amount of time, often seven years, such as new windows, enhanced mechanical equipment, or insulation. The developer often passes on the extra building costs if it takes longer to recover the initial investment. The developer may decide to make capital upgrades now if it is less than or sooner than seven years.

Subcontractors may be out of pocket for two months before receiving payment in response to "payment requests," and third-tier subcontractors may wait much longer. The project owner essentially uses subcontractors as a way to temporarily finance construction. This is why it's critical for general contractors to consider a subcontractor's financial stability when deciding whether to give a contract to the "best value" subcontractor rather than just the lowest bidder. A contractor's desire to front-load their pay request schedule of values in order to operate "in the black" and using owner money rather than their own is reinforced by an awareness of the time value of money. Early budget estimates are often created by developers and contractors to help with a range of financial considerations. Preliminary design documentation may depend on facility dollars per square foot of floor ($/SF) database price that is available from sources like RS Means. Yet, even if a typical public database has hundreds of values, they are all national averages and not unique to any one project or locale. Yet, since no project is ever really "average," our case study project does not perfectly match the national average. The contract price with ECC is $24.5 million, which is much more than this spending plan. A location modifier of 1.05 (or an extra 5%) must be included only for Olympia, Washington, and much more for a distant suburban region since it was planned to be developed around 100 miles north and west of Olympia. The typical database sizes for hotels and garages are based on 50,000 SF and 160,000 SF, respectively. Nevertheless, because of the unique nature of our case study project, extra size modifiers must be used. This occurs as a result of the already described economies of scale. An extra TVM modifier would be required if a different database had been used, either an older one (published prices would be higher as mentioned in present value and future value previously) or a future database edition (prices would be lower). The budget would be raised to somewhat more than $20 million and brought closer to the contract value with ECC if all of these modifiers were taken into consideration.

While a contractor's CEO and CFO normally need to have a detailed understanding of time value of money, a project manager and cost engineer also need to have a fundamental understanding. A contractor's cash flow will be impacted if the project owner makes a late

payment, change order talks drag on, or an unfavourable amount of retention is held. Short-term construction loans are often not included into estimates by contractors. The idea behind time value of money is straightforward: $100 worth more yesterday than it is now, and $100 worth more today than it will be tomorrow. There are several formulae relating to annuities, interest, inflation, and future and present values. For the TVM newbie, the majority of the combinations have already been d out and are accessible online.

The price that one party (the bank) must pay another (a bank depositor) in order to access their money is known as interest. The borrower is one person, while the lender is another. Money cannot be used for free. The rate of inflation tracks previous value changes. If a gallon of milk costs $5 one year and $6 the next, then there has been a $1.00 price rise, or 20% inflation. We might have included an almost infinite number of additional value concepts in this chapter. For a construction estimator in particular, modifications made to published database pricing from national averages to reflect a specific project's location, size, and the year it is being constructed are one value factor that specifically pertains to time value of money.

Audits and taxes

A construction business pays income taxes to the federal government, state governments, and municipal governments equal to around one-third of its net profits. Payroll or labour taxes, sales taxes, business or excise taxes, and other taxes are also paid to different government entities. The handling of project-related financial concerns by the project manager (PM) and the worksite cost accountant is the main topic of this book. Taxes are more of a business concern and the chief financial and chief executive officers' primary area of emphasis than they are directly tied to projects (CFO and CEO). But, it is crucial for the worksite team to understand how their work impacts the company's bottom line, or net profit after tax. The impact of income and other taxes on financial ratios will be covered in this chapter. Everyone's life must include paying taxes. Taxes provide funding for the government and for societal necessities like roads and schools.

These sorts of tax difficulties are better left to other textbooks that concentrate on taxes and accounting for general company reasons since this does not include how to complete an income tax form for the Internal Revenue Service (IRS). This addresses income taxes as well as some of the "costs" or deductions that contractors will use to lower or defer taxes, which will improve their short-term cash flow situation. Also, the money generated by a company's construction activity is the main emphasis rather than the revenue generated by the equity partners' separate or independent activities. Tax rules vary from state to state and are intricate and constantly changing, so they are not always identical. Similar to talking with lawyers for contract drafting and claim settlement, contractors will consult with tax accountants, certified public accountants (CPA), and tax attorneys for these sorts of complex business concerns. But, once again, these commercial transactions take place at the corporate level rather than the worksite level. The amount that an employee gets paid on their paycheck is much less than what it costs the business to hire that person. There are many additional costs associated with labour, whether it be direct craft labour like carpenters and labourers, or indirect labour like the project manager and supervisor. The total of these extras, which includes both labour taxes and labour benefits, is known as the labour load. Several federal and state organisations have an impact on labour taxes.

The IRS is involved in federal income tax audits, making audits a subject in advanced financial management. This also introduces a number of audit types, many of which include the worksite project team, such as monthly and project-ending client audits. Many bigger contractors will also conduct internal audits of their own processes and a number of project-

specific efficiency factors. Compared to the project management and cost engineering covered in earlier chapters, audits and taxes are unquestionably advanced project management issues that are more relevant to the home office, CEO, and CFO.

Federal, state, and municipal income taxes

All people and businesses, including construction firms, are required to pay income taxes. In general, an organisation must pay more tax the more money it earns. Taxes may amount to a significant portion of income—more than one third. Construction accountants and the CFO pay a lot of attention to income taxes since there is probably not another cost code or account that a construction firm encounters that adds up to the total taxes it pays. One of the many ways construction is distinct from other businesses like food service or aircraft manufacture is that construction companies are project-based. Each construction job has to bring in enough money to cover home office costs and leave the business with enough money to meet taxes. The superintendent and project manager are ecstatic on the construction site since they recently finished a $50,000,000 primary school on schedule, under budget, with accep quality, and with no safety incidents. Yet, they did not generate $50,000,000 for their business. The construction company's corporate officers and owners generated a sizeable quantity of money that was divided up among many sources as shown before, but they were more interested in the final result—the after-tax profits. This is the real indicator of a company's performance, and it is this sum that is either reinvested back into the business or given as dividends to stock shareholders.

If done correctly, tax planning, avoidance, reduction, or deferral are allowed, however tax fraud is against the law and carries stiff fines and even the possibility of jail time. Contractors will make an effort to lower their tax liability by claiming any deductions that are permitted under the tax legislation. In addition to the direct and indirect costs of building on the worksite, some of the biggest tax deductions for contractors include: Cost of running a home office, including office rent dividends, bonuses, and salaries given to company officers, Depreciation of property and equipment, chari gifts, among other things.

Various tax schemes for various organisational kinds

Construction businesses may be set up in a number of ways, and the IRS views each of these distinct legal organisational structures differently with regard to federal income tax. Also, there are various tax repercussions depending on the method a contractor uses to record income, including cash, accrual, % complete, and finished contracts. Single-person business: The tax applications for a person and a sole proprietorship are identical. Businesses set up as sole proprietorships combine their company earnings with their other sources of income and pay the same rate of tax on everything. The IRS Schedule C, which is an attachment to the ordinary 1040 tax form, details the company's income and deductions.

Partnership: A partnership may be made up of two or more people. The partners divide the firm's revenue in accordance with their respective equity interests, which is reported on their individual 1040 tax returns and taxed similarly to if it were a single proprietorship. The corporation is not taxed. Regarding income, taxes, and personal liabilities, the partnership is open. Creditors may seize the personal assets of the general partners if there is not enough equity in the partnership to cover an obligation.

Corporation: Since a corporation is a distinct and independent entity rather than a person, it differs significantly from a sole proprietorship or partnership. A person or group of people may "incorporate" and donate stock to this distinct company. Individuals' assets are safeguarded and kept distinct from corporate obligations, unlike in partnerships. The maximum risk an investor may incur is the amount of equity they have contributed. After

taxation of the company, any residual profit that is not reinvested in the business is paid out as dividends to equity investors. The investors then declare dividends on their individual 1040 tax returns (together with Form D) and, depending on their tax rate, pay 15% or 20% tax on the payout. As a result, corporations are liable to two types of taxation: the corporate level tax on business revenue and the individual level tax on dividends. Companies are sometimes referred to as "C" companies.

S company: A subgroup of C companies is known as a S corporation (or S Corp). All of the profits go directly to the investors and are added to their own personal earnings; they are not subject to the double taxation that a typical company is. Similar to companies, equity investors are insulated from personal responsibility. Closely held companies, or S Corps, are corporations with a small number of stockholders. Many bigger businesses begin as S Corporations.

Limited liability partnerships (LLPs): While LLPs are not utilised for contractors, they may be formed as LLPs by some of the other stakeholders in the built environment, such as architects or consultants. The actions of the other partners are shielded from the view of each particular partner. LLPs are extremely similar to corporations in terms of taxation.

LLCs: Limited liability companies A subset of LLPs, LLCs have several tax ramifications that are comparable to those of traditional businesses. Corporate taxes are exempt from personal assets.

In order to ensure that the value of each construction project is independent of the others in the event that one fails, many real estate developers will establish a distinct LLC for each one. For further information on real estate development. Regarding LLPs and LLCs, various states have distinct regulations. LLCs are subject to an extra franchise tax in various states.

JVs, or joint ventures: JVs are partnerships that are typically formed for a single project. This often occurs when two contractors join forces to bid on a particularly big construction project since neither one of them alone has enough bonding capacity. For a design-build project, general contractors (GCs) and architects may also establish a JV. The JV will disband after the project is finished. Regarding taxes, the JV is identical to other partnerships.

Strategic partnerships: They are merely loose agreements between two or more businesses to collaborate in order to maybe win a new project or market share; they are not independent entities. For instance, a general contractor may team up with sizable mechanical and electrical subcontractors in a strategic alliance to prepare bids for a particular project. These unofficial agreements don't take taxes into account.

Rates of federal income tax

Personal income tax is assessed by the IRS on a "marginal" basis. Lower income levels pay a smaller proportion of tax since taxes are calculated as a percentage of net income. The person moves up to the next marginal tax rate or tax bracket when their income levels grow. Major tax reform legislation was approved by Congress in 2017 that altered tax rates, standard deductions, itemised deductions, and included other modifications to the tax code. The categories for single and married couples filing jointly have somewhat modified. There used to be and still are seven distinct progressive tax rates in both situations. For those with low to moderate earnings, the tax rate was somewhat cut; nevertheless, those with incomes above $415,000 benefited the most.

Additional tax consequences

Profits from the sale of stocks, properties, or construction equipment held for more than a year are subject to capital gains taxes. Individual capital gains tax rates range from 15% to

20% depending on tax band, and they are lower than corporate income tax rates. Profits from the sale of personal property held for less than a year are subject to regular income tax rates. Corporations are subject to ordinary income tax on their capital gains. Sales losses may be proactively lowered from the income of the previous two years or carried forward for a maximum of 20 years to offset future revenue.

Similar to capital gains, dividends given to equity partners are reported on their individual 1040 tax returns and subject to a 15% or 20% tax based on their individual tax rate. Dividends are included as business expenses on the corporate income statement. Calculated taxes: The IRS does not receive a single sizable payment from contractors or other companies on April 15 of every year. Contractors exploiting what the federal government views as their money is something the government does not want to happen. Pay-as-you-go is required for contractors and other enterprises, as well as quarterly projected income tax payments. This take place the next year on April 15, June 15, September 15, and January 15.

Local as well as state income taxes: The majority of states impose their own income taxes, with rates ranging from around 3% in North Dakota to over 13% in California (as of 2017). State and municipal governments need separate yearly tax forms to be filed from federal tax forms. The amount of state income tax that both individuals and companies have historically been allowed to deduct from their total federal income tax obligation has been decreased under the 2018 tax regulations. Just seven states—Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming—do not impose an income tax.

Taxes on businesses, properties, and sales

Both people and businesses are subject to a range of additional taxes. There are no generalisations about these additional taxes since each state is unique, and the tax laws are always changing. Whenever a contractor wants to submit a bid for a project that is outside of their state or their typical market, they should educate themselves as much as possible on the tax laws in that region. Below are a few instances of various tax structures in states with various tax laws. Keep in mind that they cannot be "added-up" as some attempt to do, particularly when looking for a location to launch a company or retire from the workforce. Before making official judgements, a company or investment tax specialist should consider a number of different factors. Additional company taxes that are revenue-based rather than necessarily income-based may be imposed by certain states and towns. Business tax, business and occupational tax, or excise tax are the names of these levies. It is difficult to draw a valid comparison since these phrases have diverse meanings in various contexts. These taxes may be levied in certain jurisdictions just on booze and cigarettes, on real estate, or on the whole income a business generates, independent of costs or profits. Regardless of expenditures, Washington State and local governments impose a roughly 1% state excise tax on all components of the built environment, including contractors, designers, and consultants.

Depending on the assessed value of the upgraded property, property taxes, if any, are often paid by the client or developer to cities, counties, and states once the project is finished and on an annual basis afterwards. Every state levies property taxes in a different way, some on the land alone and others solely on the improvements. As of 2017, New Jersey had the highest effective property tax rate (2.38%), while Hawaii and other states had the lowest (0.3%). Nevertheless, county and local rates may also be in effect.

Sales taxes are a distinct tax that may be applied to specific project values or simply a fraction of the cost of construction, such as a sales tax on supplies but not labour. In other circumstances, taxes are left out of bids and contracts, but the general contractor still collects them from the customer with monthly pay requests and pays the state. Just five states—

Alaska, Delaware, Montana, New Hampshire, and Oregon—do not impose sales taxes at the moment. Sales taxes are imposed in the remaining 45 states, and they vary from 4% in Hawaii to over 10% in Louisiana, including county and local taxes. While Alaska doesn't have a state sales tax, some municipal governments there do.

Labor charges

Contractors pay substantially more for direct labour than only the rates paid to administrative managers and skilled labourers. The term "labour load" refers to the extra markup or percentage that contractors pay on top of all of the salaries they pay. Labor burden is a direct cost of performing labour rather than a charge or profit markup. Project managers and superintendents do not decide how much of a markup to apply on the worksite. Instead, the CFO and CEO levels are where the labour load is decided. The burden often does not come with a separate invoice and is recorded as a journal entry charge to the worksite.

Necessary labour taxes

Despite the fact that they are separate and have varying prices and rates for various kinds of work, some people will refer to the whole labour burden as either labour taxes or labour benefits. Payroll taxes are another name for labour taxes. Contractors are obliged to pay labour taxes that are decided by the government and contain at least four primary components, including: The Federal Insurance Compensation Act, usually referred to as Social Security or FICA, was introduced. The employee pays the other half as a withholding from their weekly paycheck, making a total tax of 12.4%. The employer contributes half of the FICA payments, or around 6.2% up to the first $120,000 in salary (changed annually). Similar to FICA, Medicare is a combined payment made by the employer and the employee that is equal to around 1.45% of the first $117,000 earned for a total contribution of 2.9%. Federal and state unemployment taxes each have different rates, with the federal rate costing 6% on the first $7,000 of income and the state rate varying from state to state. Every company's payment of unemployment tax is inversely correlated with the number of unemployment claims it receives as a result of staff reductions. The cost of workers' compensation insurance markups, also known as workers' comp, varies widely depending on a number of variables, such as the contractor's safety record and the experience modification rate (EMR) that goes along with it, the potential safety risk of the labour craft, and the distinction between direct and indirect labour. The EMR at rest is 1.0. An EMR rate more than 1.0 indicates a contractor has a higher occurrence rate of safety accidents, while a rate less than 1.0 indicates a contractor has fewer accidents. Certain professions have a greater percentage of workers' compensation because they are more prone to accidents. Workers compensation rates for indirect salaried employees are far lower than those for direct work craftsmen because they are considerably less likely to have a safety mishap. For union and merit shop contractors, the labour tax markup is the same proportion, but it is wage-related. In general, labour taxes will be greater the more a craftsman is paid. labour advantages

Labor benefits, usually referred to as fringe benefits, are established by the contractor and consist of a range of things. They are voluntary payments rather than "taxes" per se. This topic is covered since they make up a significant component of the overall labour load associated with pay. Contractors who are union members are likely to get more labour benefits than those who use merit shop workers.

The expense of certain labour benefits, including health insurance, is split between the employee and the employer. Some contractors may incorporate more or less of these possible labour benefits in their labour burden rates depending on the contract conditions and the definition of reimbursable expenses for open-book projects.

Burden of labour

Carpenters and electricians are examples of direct craft workers whose labour load rates vary significantly from those of indirect workers (project manager and superintendent and CEO and CFO). Moreover, rates vary amongst crafts or trades based on the nature of the task and the related risk to safety; ironworkers and electricians have more safety incidents than painters and landscapers. The labour load is also impacted by a number of union-related factors, such as the fact that certain crafts depend on the contractor for their tools. Subcontractors are in charge of covering their own labour costs; the general contractor is exempt from this responsibility. 18.2 lists the pay rates for several trades together with any related labour taxes and responsibilities. For a CFO of a construction firm, it would be exceedingly time-consuming to invoice or record distinct worksite labour load rates for each sort of craft or administrative labour category. At the start of the year, the majority of contractors will create a "blended" burden rate based on labour mixtures from the previous year. A general contractor who is a signatory to the carpenters, labourers, ironworkers, and cement finishers unions may have a blended burden rate of up to 55%. Due to a combination of the above described reduced labour benefits, contractors that use merit shop workers will have a lower overall labour burden percentage markup, maybe by 25%. Normally, direct and indirect labour are kept apart since the burden rate of indirect work is so much lower than that of direct labour (perhaps 30%), however even these two types of labour may be combined on certain projects, again depending on the conditions of the contract. For open-book projects, some contractors may also charge their customers a "loaded" pay rate that combines the base rate and a blended burden rate. Contractors could decide to do this since a loaded pay reflects the complete cost of an hour of direct work, but as will be detailed later, it is difficult to prove during an audit of an open-book project. Hence, $51 would be the loaded hourly pay rate for workers. Some markups that some contractors add with labour load, such liability insurance, are volume-dependent and unrelated to labour, therefore they are inaccurate for projects that have a varied ratio of direct work to subcontracted labour. Federal financing for construction projects mandates that contractors pay direct craft workers a "prevailing wage rate," which consists of the wage rate most typical to the region being worked plus labour taxes. The Davis-Bacon pay rate is another name for this. Hence, the union pay rate is said to be "prevailing." The decision to provide labour benefits above and above the prevailing pay rates is left up to the contractor.

Only a contractor's own direct and indirect labour is subject to labour burden charges. The cost of labour is not added to the cost of materials, equipment rentals, or subcontractors. Subcontractors must account for their own labour costs when submitting bids to the general contractor.

CHAPTER 12
AUDITS MANAGEMENT

[1]Dr. Vedantam Seetha Ram, [2]Yashoda L
[1]Associate Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]vedantam_seetharam@cms.ac.in, [2]yashoda@cms.ac.in

One often gets a shudder down their spine when they learn that they are about to be "audited." Nevertheless, things don't have to be that way. There are several justifications for audits as well as numerous audit kinds. Audits are often only a mechanism to ensure that what the person or company is doing is right; they are not always an effort to find faults or wrongdoing.

Contractors are allowed to audit themselves. They are carried out for a number of reasons and are also referred to as internal or management audits. One is to verify that their quality, safety, scheduling, and cost management systems are fulfilling business goals. To confirm that the business is fulfilling the demands of the sector, contractors may conduct surveys of customers and individuals from outside the organisation. A second independent test or inspection may be helpful when the contractor or project team is too near to a problem to view it clearly. For the purpose of ensuring that their field management teams are operating as planned, corporate officers of construction companies may also conduct regular or unscheduled audits of jobsites. A "lessons-learned" audit, which the worksite team also produces, is considered by some to be the last stage of a construction project following close-out. This is an internal review of the project that evaluates what went well, what didn't, and what might be improved for the future. During this post-project audit, project managers and superintendents also assess the performance of their subcontractors and share that information with their internal colleagues. Any business, construction company, or other organisation may conduct internal audits to confirm that its financial statements will stand up to external examination. The majority of contractors, especially mid- to larger-sized contractors, will first perform an independent internal audit of their financial conditions with their own accountants and bookkeepers, and then hire the services of an outside certified public accountant to perform an audit. This is because equity partners and the bank must be confident that the financial data reported by the construction company is accurate. The simpler it is for an outside CPA to conduct an independent audit that verifies the financial results or findings, the better prepared the books are by the contractor's own accountants. Given that CPAs often bill by the hour, this will also lower the cost of the audit. The CPA audit's objective is for the auditor to compile a report and provide an official "unqualified opinion, without exception" that the construction company's financial statements are true and correct and that they have been produced and presented honestly. A contractor's backlog, accounts receivable and payable, project manager monthly fee predictions, as well as any possible internal theft or fraud perpetrated by the contractor's own staff, will all be examined by CPAs in addition to the balance sheet and income statement.

The construction industry is distinct from other industries, as discussed throughout this book. As a result, a financial audit of a construction company is also distinct and difficult for a number of reasons, such as the lengthy nature of construction contracts, billings based on a percentage of completion, client withholding of retention, allocation of equipment and

overhead to particular projects, and many others. Accountants who are certified public accountants are by definition 'independent'. They are compensated by the construction business for their services, but they are also expected to have passed the Unified CPA Examination and adhere to the standards set by the American Institute of Certified Public Accountants. Contractors may also use a CPA's skills to help with tax preparation, financial planning, and determining internal stock value.

Customer audits:

Clients may be permitted to see the contractor's books for a specific project, depending on the contract's provisions, particularly if the customer is a private party on a negotiated open-book project. These audits may be carried out every month or only once, as part of the project's final financial close-out. Whatever the timing of the audits, the contract must expressly describe the owner's needs and provide enough time for the contractor to prepare their accounts for examination. Project managers and worksite cost accountants will be crucial members of the general contractor's jobsite team during client audits.Typically, monthly pay requests are processed together with monthly audits. As it would be difficult for the project owner's accountant or auditor to verify the expenses of each pay request prior to payment, the audit is often carried out after the pay request has been completed. In this instance, Evergreen Construction Company's February pay request for the Olympic Hotel and Resort project is processed as of February 28 and paid by Northwest Resorts on or around March 10. The sum to be paid is that which was agreed upon at the worksite walkthrough with the owner, architect, and bank on February 25. If the reported and forecasted costs were reasonable, the client's auditor—which may be an independent accounting firm—will analyse the contractor's actual cost records for the month of February after March 10.

The auditor's task is to confirm that all expenses claimed for the project of his or her client were, in fact, incurred for that project. Consider the following scenarios: the contractor charged the $5,000,000 grocery store project for new tyres for the contractor's CEO's luxury automobile; the contractor paid a swimming pool subcontractor $100,000; the contractor paid a subcontractor more than what was specified in their contract; etc. Any of these would be grounds for the auditor to raise an alarm. Of course, they are exceptional exceptions. Audits may sometimes just reveal mistakes in expense coding or journal entries. Slight deviations might happen, in which case the contractor would only revise their subsequent monthly compensation request. However, the GC's project manager may find it time-consuming and expensive to prepare for the auditor and address their questions on a monthly basis. As a result, this process must be taken into account in the jobsite general conditions estimate, frequently with the addition of a jobsite cost accountant to the team.

An end-of-project audit is more frequent than the monthly audit. The same kinds of records are examined, along with confirmation of percentage additions to the task cost or journal entries for things like insurance, taxes, and labour costs. It could take many weeks to complete this audit, and more than one accountant might be needed. Once again, the auditor will draught a final report, submit it to their customer, who will then talk with the contractor about any exceptions. A satisfactory audit report is often a prerequisite for the final release of retention. For an owner's representative who must report to a board of directors or other stakeholders inside the client's business to ensure that the owner's representative handled their finances effectively, this form of audit may also be required. The team at the contractor's worksite or at their home office may undergo numerous more kinds of audits. The contractor's tax returns may be subject to an IRS examination. If prevailing wages are paid on federally financed projects, the NLRB will analyse the "certified payroll" to ensure that the artisans received the proper compensation. This assessment will include looking at time logs

and pay stubs. For a prevailing pay project, subcontractors are held to the same standards. The unions may audit the contractor annually to ensure that enough labour benefits were paid for pensions and training if the contractor uses union craftsmen. Also, a variety of compliance audits and inspections will be conducted on contractors and projects by government organisations, such as the City for code compliance and the Occupational Safety and Health Administration (OSHA) for safety breaches.

Taxes are a necessary component of both our personal and professional life and cannot be ignored. All companies, particularly contractors, may benefit from a thorough grasp of taxes and wise tax preparation. A contractor's net profit is the amount left over after all worksite and home office expenses have been subtracted from revenue and taxes have been paid. Particularly when contrasted to the dangers connected with the building industry, the resultant number or percentage is rather low. Federal income taxes for individuals are assessed at a marginal rate. The percentage of tax that must be paid likewise increases to the subsequent marginal level when income levels climb. The marginal tax rate is the highest possible amount of taxation. The average or effective tax is the total tax paid divided by the income that was reported. There are tax benefits to operating as a sole proprietor or corporation at various income levels, because individual and corporate tax rates fluctuate.

Individuals and businesses are required to pay several additional state taxes in addition to the federal income tax, such as income taxes, company taxes, property taxes, and sales taxes. When making a proposal, a contractor pursuing a project in a new state must fully comprehend the local tax ramifications. Government mandated labour levies provide social security and workers' compensation. Direct and indirect earnings may also include additional worker benefits. The combined labour taxes and benefits markup, which may be more than 50% of the cost of wages, make up the entire labour burden. An audit is a verification of the contractor's financial records' correctness. Audits are conducted for a range of internal purposes, such as cost performance of certain people and groups as well as reporting to corporate equity investors. In an open-book project, the client is responsible for conducting external audits; this need must be clear in the contract before work can begin. If the contractor's books are not maintained consistently and accurately throughout the duration of the project, they may be rather difficult. External audits may be carried out by other organisations, such as the IRS for tax reasons or unions to confirm labour benefits have been paid.

Performance of the Developer

The real estate development industry has many facets, but one of the most straightforward, understandable, and controllable is construction. Construction is far less dangerous than development, and the developer must take numerous steps before the contractor pours the first concrete into the footing forms. The emphasis of the last will veer away from contractors entirely to talk about the role of real estate developers and how they relate to building costs and accounting procedures. There are several other worthwhile publications on real estate development, many of which are accessible through the Urban Land Institute; this book is not one of them (ULI, reference uli.org). A valuable resource for anybody interested in the built environment's growth is the National Association of Industrial and Office Parks, which represents commercial real estate developers (reference naiop.org). While real estate development and the developer's pro forma are complex subjects, the construction project manager (PM) who has a contract with a developer might benefit from a concise summary. The business of real estate development and many of the processes or phases of the development process are covered in the first section of this chapter. The compilation of the

developer's pro forma, construction loan applications, monthly draws and payments, and other financial ratios that control development choices are financial components of real estate development that may have an impact on the job of the construction PM. The glossary also includes other terminology and expressions used in the real estate industry in addition to those that were discussed here.

Business of developing real estate

Many people working in the built environment (BE) sector are envious of real estate developers' positions. The person or business that develops a property is seen to be very risk-taking and to make the most profits. Very few recent graduates in construction management will begin their careers in real estate development; normally, they must first accumulate about 10 years of experience in some area of the Industry and have a knowledge of the developer's function.

Clients and project owners are not all developers. Several owners "build to suit" projects only for their own wants and personal occupancy and do not intend to sell the property once it is finished. These owners are more likely to split the building's ownership from that of the company; doing so will benefit the real estate investment financially and offer asset protection. The fact that these project owners are also the tenants makes their projects far less hazardous from the lender's standpoint, even if they may confront many of the development phases, such as pro forma preparation and loan applications, as detailed here.

When operating exclusively for the aim of enhancing property for financial advantage, there are various possible forms that a real estate development business will use. Developers who are single proprietors include this author. A development partnership may be formed by two or more people, and as they expand and add more staff, they evolve into a development firm. Land developers buy vacant lots and "horizontally" develop them by dividing them, building roads, and adding amenities. This is also typical of speculative house construction. Vertical developers construct residential complexes and office buildings, lease them out, then either keep onto them for a while or swiftly "flip" and sell them. Developers may also buy an existing building, make renovations or changes to its usage, and then "flip" it to make a quick profit. Without investing any of their own funds or stock in the project, fee developers or development agents oversee the whole process on behalf of an investor. In this chapter, the word "developer" will be used to refer to all of these types of real estate development. Several of the before mentioned built environment players are interested in entering the field of development because they see it as being very lucrative. While it may be profi, development is also exceedingly dangerous and often bankrupt. As in any firm, the predicted profits rise in proportion to the level of risk. Success in a development depends on a variety of variables, including the developer's skill, market timing, and sometimes plain good fortune. For instance, the planning phase for an apartment complex may start during a rental market boom but take five years to complete, including design, permits, and construction. The structure is now ready for leasing, but because of the saturated market, it is now impossible to rent units for the amounts predicted in the pro forma. Market timing is very difficult to anticipate, and the risk of missing it necessitates huge profits. Different ownership arrangements for each property are one method a developer might reduce risk. The client for the Olympic Hotel and Resort example case study project in this book is Resorts International, Inc. (RII), however RII will not directly control any of its projects; instead, they will create a distinct and independent limited liability company (LLC) for each one. In this approach, if one property had financial difficulties, it wouldn't have an impact on the other properties; in other words, RII's original owners or investors would be protected from creditors on any specific project. In this instance, the Olympic Hotel project's owner has been established as Northwest

Resorts, LLC. Some developers will also work as general contractors. This is especially true for speculative home builders who will construct homes using their own teams or subcontractors, develop land horizontally, and then advertise and sell the finished result. Some commercial GCs could create a development section or arm that would likewise be a distinct and independent business, often a limited liability corporation, with the firm's officers as equity shareholders. So, in effect generating employment for itself, this developer will engage itself as a contractor to carry out tasks. In this case, the parties will actually sign a construction contract and make an effort to keep their interactions separate. This is easier said than done, according to the author's own experience.

The creation procedure

As previously noted, there are several early and time-consuming measures that the developer takes that most contractors are unaware of. After all of this preliminary work, such as obtaining financing and permissions, is finished for a bid project, the contractor joins the team. Several members of the built environment who are interested in getting into the development sector aren't aware of all these phases or how much time and money it takes to get a project to the building stage. Several stages are described in this section, along with some of the activities that take place in each one and other BE participants the developer will use throughout the development process. The construction of a structure and buying a plot of empty land are just a small portion of the development process. It's crucial to do market research study early on and sell the product continuously. A successful project often arises from the combination of leadership and innovation used to manage the whole process. The following real estate development formula illustrates the development process:

Levels of development

There are eight stages or phases in every real estate development project, according to the Urban Land Institute's (ULI) Real Estate Development, Principles and Process. Similar stages are described in other sources. These are the eight stages:

An concept's inception includes market research on the target market and the area, idea refinement includes site selection, and feasibility analysis includes a rough design and more market research. This entails producing a due diligence investigation and improving the developer's pro forma; Negotiation of a contract with the seller of the real estate, as well as possible purchasers, renters, and lending institutions. Several of these contracts will be 'conditional upon' the feasibility study's successful conclusion and the successful negotiation of the other contracts. Contract execution will include include real estate acquisition and construction contracts, as well as obtaining financing.

Like with design-build projects and certain negotiated fast-track projects, the project's design advances from development stage one all the way through stage five and maybe into stage six.

Team for development

The owner, designer, and contractor are the three main players in any project involving the built environment. 3 explained their interaction and the structures of the building team. Given that the majority of these participants work directly for the developer, the developer's organisation is substantially broader and is shown as having a fairly horizontal organisation chart. Organizations in the architectural and construction industries are more vertical, with employees, subcontractors, and consultants reporting to and working for other firms. The majority of the work outputs from these development team members are regarded as soft costs, with the exception of the general contractor's scope, which is a hard cost. While they are essential, you often cannot see their direct impact on the finished structure. Before lender

financing has been obtained, some of these firms are hired as early as stages 1 through 3 of the development process. So, the developer must pay for these services himself or using owner equity (OE). Below is a list of some of the businesses and people that were hired early on to be a member of the due diligence team.

A sample:

The developer's pro forma is a complex equation with several variables that is often altered by various developers for various projects. The pro forma may be seen as the comprehensive financial study required to ascertain if the project "performs" and represents a sound real estate investment. The pro forma must be submitted with the loan application package, per the bank's requirements. The pro forma is a crucial decision-making tool for internal development equity partners as well as possible outside investors. Early on in the process—during the initial development stages 1 or 2-a very basic, "back-of-the-envelope" pro forma is created. All the way through the development phase, building completion (phase 7), and into occupancy, the pro forma is adjusted and modified (phase 8). The pro forma compares the project's anticipated cost to its expected value by combining several cost projections. The project is probably a "go" if the predicted value is between 10% and 15% more than the estimated cost, however it is a "no-go" if the expected expenses are close to or surpass the value. Developers also refer to this idea as "does it pencil?" Or does the investment in real estate development make sense? In either case, the developer may return to the pro forma and alter one or more of the variable values to see whether a new outcome is produced.

The first three of these may need to be financed by owner's equity, and the developer may only be eligible for a construction loan based on the project's cost, schedule, and value. 19.2 is an example abridged pro forma for a spec office building case study created by Evergreen Development, LLC. A full pro forma with estimate spreadsheets supporting each of the line items given here might be over 100 pages long. All of Evergreen Construction Company's officers, including the chief executive and chief financial officers, make up its development arm, Evergreen Development (CEO and CFO). For all new development projects, Evergreen Development always enters into a contract with Evergreen Construction. On the eResource, there is a live Excel version of the pro forma. Keep in mind that the pro forma only includes one line item for the basic construction estimate. This proves the prior claim that building is just one part of the process and that the developer faces significantly larger risk and early financial outflow than merely construction. This financial management topic includes the significance of the pro forma since project managers, estimators, and project accountants all need to understand how they fit into the developer's overall financial picture. The capitalization rate, sometimes known as the "cap rate," is one of the most significant pro forma factors. The expected economic worth of the building after construction is determined using the cap rate, and from there a loan amount may be derived. Some banks evaluate a building loan using typical cap rates. The formula used to determine the cap rate is:

The developer may borrow more money, perhaps utilizing the revenues from a loan on one project to leverage another, the greater the estimated value of the building. Loans and leverage are covered later. The expected value is calculated by mathematically dividing the cap rate by the projected net operating income (NOI) as follows:

Loan for construction

Several basic financial courses in business schools include extensive subjects like loans and interest, financing, and loan fees that are deserving of their own chapter, if not whole textbook. This expands on the covering of construction worksite cost accounting to include the contractor's customer, the developer. This part includes a longer review of the developer's

construction loan and obtaining permanent financing, as well as a short discussion of contractor financing. For construction project managers and worksite cost engineers, this provides a brief introduction to a variety of important financial concepts. Future CEOs and CFOs of corporations will be allowed to conduct a more thorough investigation.

Funding for Contractors

This author will inform you that commercial and custom home building PMs do not finance construction projects. She is a former senior project manager and the owner of a construction firm. Contractors are not in the business of giving their customers short-term loans. The cost of the building project is the client's responsibility. Looking back at the case study construction estimate, it can be seen that there isn't a line item for debt financing or a construction loan. As has been discussed throughout this book, contractors want to operate in the black and use innovative strategies to produce positive, not negative, cash flows. Long-term loans and short-term loans are the two main forms of financing for construction companies that are periodically required and are handled by the contractor's CFO.

Contractors may look for long-term loans from commercial banks to expand their businesses, which may include buying land, buildings, or construction equipment. Long-term loans often have a repayment duration longer than a year. In the balance sheet of the contractor, a long-term loan is shown as both an asset (cash) and a liability (due to the bank). A long-term loan will have both interest and principal payments due. The ratio of interest to principal is much bigger (almost all interest) early in the loan duration and significantly lower (nearly all principle) late in the loan life. Equipment is often financed for five years, whereas buildings are financed for 15 to 30 years. The contractor's ownership may contribute extra equity, also known as owner's equity, or it may add new partners or sell shares, diluting ownership, as an alternative to seeking long-term growth financing from a bank. When the money is immediately at risk, OE often needs a greater rate of return (ROR), therefore if a contractor can reduce their OE, they will do so.

When a loan is insecure, the bank does not demand that any assets or collateral be held in escrow, guaranteed, or made readily accessible in the event that the contractor fails on the loan. When a loan is secured, the bank ties itself to a resource the borrower has made accessible. The bank effectively assumes the role of a first lien holder or co-owner of the property. unsecure loans Owners of construction companies will be compelled to pledge their personal assets, such as their houses or other real estate, in exchange for a bank loan for equipment or real estate.

If the construction projects themselves cannot be self-funded, short-term loans may be required to finance ongoing building operations. Loans taken out for a short period of time must be repaid in a year or less. The loan principle is often paid in full as a balloon payment when the loan matures, however occasionally just interest is paid on the loan, sometimes all at once. A short-term loan is said to be "discounted" if the interest is paid in full up front. As "lines of credit," short-term loans are set up so that the contractor has access to a pre-approved sum, such as $500,000, which is kept on file with the bank and is accessible whenever required.

For the bank to hold this money, a minor fee of 0.5-1% will be charged, and when it is borrowed, current interest rates will apply until the money is returned. To provide short-term financing and reduce the need to borrow from their line of credit, contractors may also utilise more subcontractors and fewer direct artisans. Contrary to what was previously described in the cash flow and pay request chapters, subcontractors are not "paid until the GC is paid."

Construction financing

One of the most crucial partners and members of the team for the developer is the banker. Developers depend on banks to provide funding for their projects and increase their power, much as contractors require bonded sureties, insurance firms, lawyers, and accountants as strategic partners. There are various facets of development financing that relate to financial management and construction accounting. Leverage, long-term financing, and construction financing will all be covered in the sections that follow. Stakeholders in the building industry and other sectors often ask, "Where is the money?" Nobody would get paid if there was no bank. How far away the "money" is from the suppliers, craftspeople, and subcontractors is shown by the following formula:

Maybe more than any other business, real estate developers are aware of the value of leverage. Leverage is the process of getting the most use out of one's equity. The developer seeks to utilise money belonging to other people to enrich himself.

The "risk-reward" notion is linked to the idea of leverage. This was first used when a contractor would estimate the cost it would add to a construction estimate based on a number of perceived risk factors. When it comes to real estate development, the more a developer leverages out and borrows from others, the more risks are taken on and, as a result, the higher the projected rates of return. In the following formulae, the risk-reward connection: The construction loan will be used by the developer before the permanent loan is used, thus it would appear that the construction loan should be discussed first. Yet, it is presented this way since the permanent loan application comes first and a construction loan can only be obtained once the permanent loan has been pre-approved.

Developers will pay a mortgage broker up to 2% of the loan amount so that they may shop around for the best permanent financing option. The pro forma often includes this cost as a line item. Lenders for both construction and permanent loans are conservative by nature. In the event that a developer or contractor fails, they are not in the business of owning and running buildings, much alone unfinished construction projects. Bank loans to unreliable developers and poorly managed building projects, as well as loans that did not demand a down payment, all contributed to the financial crisis of 2008. Currently, it is common for the lender to insist that the developer have a minimum of 25% ownership interest in the project, or a lot of "skin in the game." Developers may also recruit investors or silent partners to provide equity. The period of the permanent loan, usually referred to as a mortgage loan, ranges from 15 to 30 years. Similar to the long-term loans for contractors previously discussed, repayment of the loan consists of a mix of interest (more upfront) and principle (more in the latter years). The projected value of the finished project and the anticipated revenue stream or rent are used to calculate the amount that will be financed. The developer must "pitch" and "sell" the bank on their planned proposal.

Commercial banks generally provide construction loans. The construction loan is a short-term, temporary loan that is normally only good for a year or until the building project is finished. The permanent loan might potentially be provided by the same bank. A developer may only get a loan from a construction lender if it has previously obtained a permanent loan. The general contractor's (GC) performance and payment bonds, as well as the completion of the design and possession of all necessary permits, are all requirements of the construction lender. This implies that the whole development contract must come together at once, which is kind of a "chicken or egg" dilemma - which comes first, the permanent financing package or the development deal? The principal of the loan is reimbursed in full at the conclusion of the project, often directly from the permanent lender, and the developer pays just interest while the project is being built. The pro forma has a line item for this interest, which is also

referred to as "debt service." The developer collects bills from each member of its team during the building process, including the general contractor, architect, and consultants. Further fees and soft charges are included, as well as the interest paid on the construction financing. To the customer, the developer's pay request will seem to be very similar to the GC's pay request. The developer's payment request is often referred to as a "draw" since they are taking money out of the construction financing. An inspector who will take part in the GC's draught schedule of values review at the worksite, which takes place around the 25th of each month, may be hired by the bank. The developer depends on the GC's willingness to work with the bank to help with pay request acceptance. At the end of the month, on or around the 30th, the GC sends the developer an invoice, which the bank typically processes and pays by the 10th of the following month.

A significant incentive to finish the project is the developer's ability to convert the construction loan into a permanent loan after work is complete, which has an interest rate that is generally one to two percentage points lower. The construction lender is therefore removed from the equation, making this permanent debt a "take-out loan." The bank will expect the developer to provide many of the close-out documentation included in that the customer had demanded of the general contractor, including certificates of significant completion and occupancy as well as complete and unconditional lien releases. Other financial terms and charges that affect real estate development include points (a fee for a loan), gap loans, bridge loans, mezzanine loans, ground leases, land leases, balloon payments, adjus rate mortgages (ARM), basis points (a portion of 1%), closing costs, amortisation, escrow fees, title insurance, appraisal costs, and a number of others. These topics will be saved for a later, more in-depth financial discussion, maybe after the reader has worked as a construction CEO, CFO, or real estate developer.

Financial ratios

Several financial ratios for the construction contractor have been established and detailed in On Cost Accounting and Financial Management. These ratios were obtained from the contractor's balance sheet and income statement. While determining the viability of a real estate development project and filing for a loan, a developer will also create other financial ratios and computations.

The final of this cost accounting and financial management book was saved for real estate development since it is a far more involved and complex component of the built environment industries than is merely building. The clients of the contractor are often developers. Owning a development may be done in a variety of ways, by both small businesses and big organisations. Several other BE participants desire to go into real estate development since it is regarded to be a highly lucrative industry. While it may be lucrative, development is also quite dangerous and depends on the developer's connections and expertise with its many team members, including the bank. Real estate development involves a lot more than simply purchasing property and building a building. Together with management experience, it requires a solid awareness of the industry, market research, and product marketing skills. The developer's ability to effectively coordinate the involvement of several stakeholders to generate value is what makes everything work, particularly on successful projects. Synergy is the "glue" in real estate development that proves "the whole is greater than the sum of its parts." The developer must submit a number of paperwork to the bank in order to get construction and permanent financing. The pro forma is the document with the greatest variables and the most scrutiny. The pro forma determines the project's estimated worth based on site acquisition expenses, land improvements, hard construction costs, and a number of soft costs. Contractors are not in the business of providing construction financing, but they

will arrange long-term financing for company development and equipment acquisitions and retain a line of credit to handle daily expenditures. The construction loan is first obtained by the developer together with a promise for long-term funding. The bank requires a number of documents for the loan application, such as tenant leasing agreements and statements of financial condition.

Accountancy and finance

All of a company's financial transactions during a certain time period are recorded in financial statements as part of financial accounting. A business's operational health may be determined by keeping track of numerous transactions, such as income and expenses. Boards, investors, and other stakeholders often put pressure on publicly traded companies to succeed financially. To provide concise, unambiguous reporting, professionals in accounting and finance study financial accounting. You may get this knowledge by enrolling in a Master of Accountancy (MACC), a degree programme that covers accounting and financial concepts. Two well-known types of accounting are financial and management accounting. In managerial accounting, also known as cost accounting and management accounting, reports are generated for management as well as other internal users. These reports provide the basis for evaluating an organization's financial health and improving organisational performance. Nonetheless, reports for external clients, including the government and international investors, are created in the area of financial accounting. For firms, financial accounting is used to produce financial statements that cover a certain time period. The three forms of financial statements that are most often used are the balance sheet, the income statement, and the cash flow statement. Financial accounting provides the foundation for financial reporting and details the protocols, standards, and benchmarks to be followed. Small businesses, corporations, and nonprofits all need financial accountants to put together their books of accounts and create their financial reports. Financial reporting makes use of financial statements including the balance sheet, income statement, statement of cash flow, and statement of changes in shareholder ownership. Financial reporting is far more concentrated on reporting to external audiences than management (or cost) accounting, which is utilised more for internal strategy planning. It is possible to do financial accounting using the cash technique or the accrual approach, which records expenditures for expenses that have not yet been reimbursed (only cash transactions are recorded).

All forms of accounting reporting are governed by either generally accepted accounting principles (GAAP) or international financial reporting standards (IFRS) (IFRS). GAAP and IFRS are meant to ensure accuracy and transparency. Students may better understand the significance of financial accounting if they are aware of events like the early 2000s Enron debacle. This large business failure brought to light the need of keeping accurate, transparent financial records and avoiding unethical accounting techniques. Executives may make informed decisions on departmental budgeting, corporate expansion, capital expenditures, the creation of new technologies, and other matters by being aware of a company's financial situation. By expanding too quickly or investing in new facilities that it cannot afford, a company might overextend itself if poor decisions are made because they are made without consideration for the company's financial health. Businesses use financial accounting to explain their financial situation to outside stakeholders such as investors, suppliers, auditors, and regulators. The ability to analyse performance in great detail, the fulfilment of legal and financial duties, and the provision of information to creditors and shareholders that can promote investment are all benefits. Financial accounting experts may support business executives in making wise decisions regarding the direction of their organisations, luring investors, and maintaining legal compliance. Financial accounting makes use of a variety of recognised accounting principles. The reporting and regulatory requirements that the firm

must satisfy influence the choice of accounting principles to be used during financial accounting. Companies are required to use generally recognised standards for U.S. public businesses when undertaking accounting information (GAAP). To offer standard information to investors, creditors, regulators, and tax authorities is the goal of developing these accounting norms. The financial statements used in financial accounting include the five main types of financial data: revenues, expenses, assets, liabilities, and equity. Revenues and expenses are documented and shown on that income statement. They may take care of R&D and payroll, among other things. The income statement's bottom line, which is net income, is determined using financial accounting. Accounting for assets, liabilities, and equity are all included in the balance sheet. The balance sheet uses financial accounting to identify the owners of the firm's rights to potential future financial profits.

CHAPTER 13
FINANCIAL STATEMENTS

[1]Dr. Rajiv Umeshchandra Kalaber, [2]Vyshnavi A
[1]Assistant Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]prof.rajiv@cms.ac.in, [2]vyshnavi_a2015@cms.ac.in

The financial standing of a company is described in a balance sheet as of a certain date. The balance sheet summarises the company's assets, liabilities, and equity as the financial statement moves from one period to the next. Financial accounting rules determine how a company records cash, values assets, and discloses debt. A company's balance sheet is used by management, lenders, and investors to assess its solvency and liquidity. These parties may compare various balance sheet accountings using financial ratio analysis thanks to financial accounting. By comparing the amount of liquid assets to total assets, the current ratio, for instance, determines whether a corporation will likely be able to meet its short-term debt obligations.

Revenue Statement

A business's activities during a certain time period are described in an income statement. The income statement, which is often released on a monthly, quarterly, or annual basis, provides information on a company's sales, expenses, and net income for a certain time period. The recording, categorization, and recognition of revenue for a firm are all governed by financial accounting regulations. Financial statements are still useful to management even if a company may be able to create better production and marketing strategies using cost accounting techniques than using financial accounting. Conversely, the financial accounting rules governing an income statement are more valuable to investors attempting to ascertain how profi a company is and third parties wishing to assess the risk or dependability of operations.

Summary of Financial Flows

In a cash flow statement, a company's expenditures for a certain time period are shown. The report is broken down into sections that go into depth on the sources and goals for investing, operating, and financing. Financial accounting regulations set the timing of transactions, but there is typically little to no flexibility in the amount of money that must be somehow recorded for each transaction. A statement of cash flow is used by management to better understand how money is brought in and spent. Both paid-for transactions and those where the cash flow may not have yet happened are tracked by a financial accounting system that use accrual accounting. A cash flow statement only includes items that have an impact on cash, allowing for a more in-depth analysis of how revenue is used in particular.

Statement of Equity for Shareholders

A shareholder equity statement shows how a company's ownership has changed over time. The report describes how and when a company's residual value changes, along with the reasons why it changed. A company's net income, dividend payments, ownership transfers, and other equity changes are summarised in the statement of changes across shareholder equity.

Cash Method vs Accrual Method

The two primary types of financial accounting are, in fact, the cash method and the accrual approach. The primary difference between the two approaches to financial accounting is the point at which transactions are recorded (or not).

Accrual Approach

The accrual method of financial accounting is a method for generating financial statements that records transactions regardless of cash use. A transaction's consequences over time may be taken into account in some financial accounting concepts, and journal entries may be made before an item is paid for (instead of the full effect being recorded when the cash impact occurred). Think about the case where a company receives $1,000 for advice that will be provided the following month. Because technically no work has been done and no money has been produced, the company is not allowed to record the $1,000 as revenue under the accrual method of financial accounting. According to the accrual system of financial accounting, this transaction is recorded as a debit to cash and a credit to unearned income, a liability account. When a company makes money the next month, it clears any pending unearned revenue accounting and also records actual revenue. A transaction is documented whenever a benefit is acquired or a duty is taken on. often a more precise accounting approach that reflects more precise business activities. External reporting for larger, publicly listed firms is necessary. Another example of the accrual method to accounting is unpaid expenses. Consider the scenario if a company received a $5,000 electricity bill for the month of July. Even if the bill won't be paid until August, the accrual accounting technique compels the firm to record the transaction in July. In addition to debiting Utility Costs, the company records a credit to accounts payable. Once the invoice is paid, the credit is cleared.

Cash Method

The cash technique of financial accounting is a less precise, less complicated approach to construct financial statements. While employing the cash approach, transactions are only recorded when there is cash exchanged. Revenue and expenses are only recorded when the transaction has been completed with the use of money. The exchange of money is documented every time it occurs. It is often a simpler accounting method that distils a firm to what really occurred in the past. mostly used by smaller, privately owned companies with few or no reporting requirements. In the aforementioned case, the consulting firm would have recorded $1,000 in consulting revenue when it received the payment. By using the cash approach, income must be recorded as soon as payment is made, even if the task won't be finished until the following month. No journal entry is created when the company completes the work in the next month since the transaction has already been completely recorded in the month before. Under the alternative situation, the power bill would have been recorded in August (the period when the invoice was paid). Whether the charges are for services rendered in July or not, the cash method of financial accounting requires that expenses be recorded whenever they are paid and not so much when they occur.

Financial Accounting Principles

Financial accounting generally is governed by five basic principles. These guidelines specify how organisations should assemble their financial statements and are the basis for all technical financial accounting guidance. These five guidelines pertain to the accrual method of accounting. The revenue recognition principle states that revenue must be acknowledged as soon as it is produced. The Cost Principle describes how expenses are recorded on a basis and provides guidance on how much revenue should be recorded, when it should be reported, and under what circumstances it shouldn't be included in a set of financial statements. This

notion defines how much expenditures should be recorded for (i.e., at transaction cost), in addition to accurately recognising costs over time for approved cases (i.e. a depreciable asset is expensed over its useful life). The matching principle states that revenue and expenses must be recorded at the same time as they are incurred. This law tries to stop companies from declaring income one year while paying costs for that income in another year. This concept determines the order in which the transactions are recorded. The full disclosure concept dictates that financial statements be prepared in accordance with financial accounting standards that explicitly reveal a company's financial situation via footnotes, schedules, or comments. This idea determines how much information is included in financial statements. Even though financial accounting contains components of expert judgement and estimations, a set of economic accounts should be compiled objectively and without consideration for any personal bias, according to the Objectivity Principle. This rule specifies the situations in which technical accounting should be used instead of discretion.

Financial Accounting's Value

Businesses need financial accounting for a number of very important reasons. Financial accounting develops a common set of principles for creating financial statements. This standardised set of rules assures consistency across reporting periods and among distinct companies. By increasing accountability, financial accounting lowers risk. Financial accounting ensures that reports are produced according to accepted practises that hold companies accoun for their results. Financial data is needed by lenders, regulatory bodies, tax authorities, and other third parties. Financial accounting imparts management expertise. Even though alternative methodologies, like cost accounting, may provide superior insights, financial accounting may promote strategic thinking if a firm evaluates its financial data and takes reactive investment decisions. Financial accounting increases the credibility of financial reporting. Since they are overseen by independent bodies, financial accounting standards are both independent of management and a highly trustworthy source of accurate information. Financial accounting encourages transparency. Financial accounting requires that specific information be revealed about how operations were doing, the risks the business faces, and financial performance regardless of how well or poorly a corporation is performing. A few examples of occupations in financial accounting include preparing financial statements, analysing financial statements, and managing the systems or procedures used to generate financial statements.

Financial Accounting Users

Making financial statements is financial accounting's main objective. These financial statements, which are often required as part of agreements with both the business supplying the financial statements and other parties, are used by a variety of organisations. In addition to management, the following organisations also utilise financial accounting monitoring to gather data on operations:

Investors: Before making an investment, investors typically look for financial reports produced in accordance with financial accounting guidance in order to understand how a company has been performing and to set expectations for the firm's future.

Auditors: Companies could be required to disclose their financial condition to auditors. The financial statements are evaluated by auditors to make sure that correct property financial accounting principles have been followed and that there are no major omissions from the reports.

Public firms must produce financial statements to regulatory entities like the Securities and Exchange Commission. Businesses who fail to comply with reporting guidelines risk fines or

being delisted from exchanges. Regulations governing financial accounting must always be followed while producing these financial accounts.

Suppliers: Financial statements may be requested by suppliers or vendors as part of the credit application process. Suppliers may need a credit history or evidence of profitability prior to issuing credit or increasing credit to a specified level.

Banks: Lenders and other equivalent financial institutions almost usually need financial statements as part of the loan application process. Lenders will need to look at financial accounting that gives verifiable proof of a company's solid operational state before issuing a loan (or for the purpose of establishing the cost, conditions, or interest rate of the Loan).

Managerial accounting as opposed to financial accounting

The primary contrast between financial and management accounting is that whereas management accounting aims to offer information to those within the company, financial accounting seeks to provide information to people outside the company. Financial accounting is the set of rules used to produce a company's financial statements. Alternative accounting techniques used to assess financial performance and guide better decisions include cost accounting. Financial accounting seems to be the foundation for financial statements that are publicly reported; cost accounting is not authorised. The deliberate utilisation of operational data to derive information is the cornerstone of cost accounting. For instance, cost accounting may monitor the overhead, fixed, and variable expenses related to a manufacturing process. With this information, a company may decide whether to switch to a lower quality, less expensive kind of raw material. Businesses use cost accounting to evaluate their internal operations and provide reports that are only accessible to them, even if they rely on financial accounting to produce financial statements. A publicly listed company's income statement displays financial accounting. The company must follow certain guidelines about which transactions to record. The format of the report is also specified by regulatory bodies. The end result is a financial report that details how much income was produced over a certain period of time. Providing financial information regarding an organization's operational performance is the aim of financial accounting. Management is able to see reports generated by financial accounting, but many businesses find that utilising managerial accounting—a method of calculating financial performance that is internally focused and not allowed for external reporting—is more efficient. Financial accounting is the method that is most often used to compile financial results for use by outside parties. Public companies are required to do financial accounting as part of the development of their financial statement reporting. Small and private firms also employ financial accounting, however these companies could have different reporting requirements. Financial statements produced using financial accounting are used by many parties outside of a company, including investors, lenders, government agencies, auditors, and insurance companies. The rules for constructing financial statements are established by the framework for financial accounting. These regulations require businesses to translate their operations into a set of widely recognised and standardised financial statements. To ensure that firms are truthful about their operations and held accoun for their performance, accounting for funds is crucial

A financial accountant's job description generally centres on financial accounts, but there are many other responsibilities as well

Financial Statement Preparation

A company's financial statements provide a thorough account of its finances, including total revenues, expenses, and cash flow. Similar claims might be made in reference to several epochs. They could represent a company's condition at a particular period. They might

summarise transactions over a certain period of time or reflect changes from one period to the next. A month, a quarter, or a whole year may be covered by a statement. A financial accountant creates them right away once those periods have concluded. The annual financial statements of firms with publicly traded stock must be audited by a public accounting company.

Keeping Accounting Records

The information stored in an organization's accounting system serves as the basis for financial statements. While financial accountants may set up the accounting system, experts often work with one that already exists. Accounting for finances professionals make sure that every financial transaction is recorded in that system. Accountants also ensure that each transaction is documented in the right account so that it may be retrieved when needed.

Supporting Budgeting

Businesses forecast their upcoming expenditures using their prior financial data. By looking at previous expenses, businesses may forecast their yearly expenditure requirements. A company's past profits may also be used to determine if it is profi enough to cover its expenses or whether it has to put aside funds for new products or services in order to increase sales. Substantial differences between real and expected income might make firms learn their lesson and change their business strategy.

Management of Cash Tracking

A company must always have enough cash on hand to pay for expenses like loans, taxes, salaries, and bills. Financial accountants keep track of the money in a company's bank accounts. They can really forecast if there will be enough cash on hand for certain future dates by keeping an eye on indicators like accounts payable and receivable.

Internal Control

A business's books are a complicated network of related accounts that must all balance. Financial accountants are on the lookout for anomalies that need investigation and correction. To ensure the correctness and integrity of the accounts, financial accountants may do a periodic audit of the books in larger firms.

Financial Statements Presentation

This Framework presents the concepts underpinning the preparation and presentation of financial accounts for various stakeholders. The objectives of the Framework are to: assist financial statement preparers in implementing accounting standards and addressing topics that haven't been the subject of an accounting standard; assist the Accounting Standards Board in developing excellent accounting standards and reviewing current financial statements; assist the Accounting Standards Board in fostering consistency among rules, accounting practises, and practises related to the preparation of financial statements. As it is not an accounting standard, this Foundation does not provide standards for any particular measurement or disclosure issue. No specific Accounting Standard is superseded by this Framework. The Accounting Standards Board is aware that there are a few situations in which the Framework and an Accounting Standard can conflict. The provisions of the Accounting Standard take priority over those of the Framework where there is a conflict. Yet, even while the Accounting Standards Board will be guided by the Framework in the creation of new Standards and in its assessment of existing Standards, the number of instances of disagreement between the Framework and Accounting Standards will eventually decline. The Framework may sometimes be modified based on the Accounting Standards Board's practical experience with it as well. The Framework's primary emphasis is the general-purpose

financial statements (often referred to as "financial statements" throughout). These financial statements are prepared and sent at least once each year, and they are created to satisfy the common information needs of a wide range of consumers. Some of these customers may want information that is not included in the financial statements, but they might be able to get it.

Since that many users must rely on the financial statements as their main source of financial information, it is important that they be prepared and presented with their needs in mind. Special purpose financial statements, such as prospectuses and tax computations, are not covered by the Framework's scope. Nonetheless, the Framework may be used in the development of these kinds of special purpose reports if their demands permit. Financial statements are a part of economic reporting. Typically, a complete set of financial statements includes a balance sheet, an income statement (sometimes referred to as a "income statement"), a cash flow statement, as well as any notes, extra statements, and supporting materials required to comprehend the financial statements. They might also include additional schedules and statistics that are created from or based on such statements and are meant to be read in conjunction with them. Among other things, these schedules and additional information may include disclosures on the effects of changing prices as well as financial information specific to the firm and to geographical regions. Nevertheless, the director reports, chairman comments, management discussions and analyses, and other items that would be in a financial or annual report are not included in financial statements. 8. The Framework is applicable to the financial statements of all reporting entities engaged in commercial, industrial, and business activities, whether in the public or private sector. Consumers for an organisation that reports rely substantially on the financial statements as their main source of financial information.

Customers' Information Requirements

A wide range of individuals utilise financial statements, including present and potential investors, employees, lenders, suppliers, and other business creditors, as well as customers, governments, governmental agencies, and the general public. To meet part of their informational needs, they utilise financial statements. These requirements include the following:

Investors: Those who invest risk money are concerned about the potential risks and rewards of their investments. They need information to determine whether to buy, hold, or sell. They are also seeking for information that will enable them to assess the possibility of dividend payments by the firm.

Employees: Employees and the groups that represent them are concerned about the stability and success of their companies. Also, they are seeking for information that would enable them to assess the company's ability to provide remuneration, retirement benefits, and employment opportunities.

Lenders: Lenders are looking for information to determine whether or not the principle and interest on their loans will be repaid when due.

Suppliers and other business creditors are often interested in data that enables them to determine how likely it is that the money they are owed will be paid on time. Trade creditors are thought to be more interested in a firm over a shorter period of time than lenders, unless they are dependent on the business's existence as a significant customer.

Customers: If they depend on a company or have a close connection with it, customers are especially interested in knowing about the company's future.

Governments and related organisations are interested in corporate operations because of how resources are distributed. They also need information in order to manage corporate operations, create taxes legislation, and act as the basis for figuring out national income and other data.

Public: The general public is impacted by businesses in a variety of ways. Just two examples of how companies may greatly strengthen the local economy are the number of employees they hire and the suppliers they choose from the neighbourhood. The public may benefit from financial statements by learning about recent trends and changes in the enterprise's performance and the breadth of its activities.

The information requirements of these users cannot all be entirely satisfied by financial statements, however there are certain needs that all users share. As they provide the risk capital for the business, investors want more detailed information than some other consumers. The bulk of other users' requests for financial statements will also be met by the production of financial statements that meets their requirements.

Financial Statements' Goals

Financial statements serve as a tool for various users to make financial decisions by detailing an organization's financial situation, operational performance, and cash flows. The financial statements developed for this purpose satisfy the bulk of regular client expectations. Financial statements don't usually include non-financial information and mostly represent the financial effects of past events, thus they don't always provide customers all the information they would need to make wise financial decisions. The results of management's stewardship, or its accountability for the assets that have been entrusted to it, are also reflected in the financial accounts. In order to make financial decisions, such as whether to maintain or sell their assets in the company or whether to re-appoint or replace the management, customers may seek to assess the management's stewardship or accountability.

Performance, cash flows, and financial condition

In order to make wise economic decisions, users of financial accounts must evaluate an enterprise's ability to produce cash and cash equivalents as well as the timeliness and predictability of their production. For instance, a company's capacity to pay its employees and suppliers, pay interest expenses, recuperate loans, and distribute earnings to its owners are all ultimately determined by this capability. Users will be better able to evaluate a company's ability to create cash and cash equivalents if they are provided with information that focuses on the company's financial status, performance, and cash flows. A company's financial status is influenced by its capacity to adapt to changes in its operational environment, economic resource management controls, financial structure, liquidity, and solvency.

Understanding the economic resources under its control and its previous capacity to alter those resources is necessary in order to forecast the enterprise's future ability to create cash and its cash equivalents. An organization's financial structure may be used to predict future borrowing needs, how future revenues and cash flows will be distributed among stakeholders, and the possibility that the group will be successful in securing more financing. Information about the company's liquidity and solvency may be used to anticipate its ability to pay its debts when they fall due. The ability to get cash soon enough to meet current commitments is referred to as "liquidity." The longer-term capacity to raise money to meet financial commitments when they come due is referred to as "solvency." Information about an enterprise's performance, in particular data on its profitability, is required to assess future changes in the economic resources that a firm is anticipated to control. Understanding

performance variability is essential in this respect. Performance data may be used to forecast the company's capacity to generate cash flows from its own present resource base. It also aids in decision-making on the company's potential use of new resources. Information on cash flows is useful in evaluating an organization's investing, financing, and operating activities throughout the course of the reporting period. Users may use this information as a starting point to assess the company's ability to generate cash and cash equivalents as well as the conditions for utilising those cash flows. The bulk of information about your financial condition may be found on a balance sheet. The primary source of performance information is an accounting statement of earnings and losses. A cash flow statement that details cash flows is part of the financial statements. The components that made up the financial statements were related because they depict different aspects of the same transactions or other events. Even though each statement provides information that is unique from the others, none of them is likely to be used for a single purpose or to contain all the information needed to meet a particular user's needs. The financial statements also include notes, additional schedules, and other information. For instance, they could offer additional information on the profit-and-loss statement and balance sheet items that is pertinent to users' needs. The company's risks and uncertainties, as well as any resources or commitments not shown on the balance sheet, could be disclosed (such as mineral reserves). Additional information may be provided, including information on market and geographic groups and the effects of changing pricing on the company.

Accrual Basis

Financial statements are generated utilising the accrual basis of accounting in order to fulfil their aims. According to this concept, the outcomes of transactions and other occurrences are reported on the financial statements of a periods to which they apply and are recorded in the accounting records at the time they occur (rather than when cash or a cash equivalent is collected or paid) (rather than when cash or a cash equivalent is obtained or paid.

The accrual basis of accounting gives users knowledge about both present and past transactions involving the payment and receiving of cash, as well as future financial commitments and resources that reflect those transactions. They thereby provide the information about prior transactions and other events that customers find most useful when making financial decisions.

Moving Forward

While creating the financial statements, it is common to make the assumption that a firm is a continuing concern and would, thus, continue operating for a reasonable amount of time. Therefore, it is assumed that the company has neither the intention nor the need to liquidate or significantly reduce the scope of its operations. If either of these circumstances exist, however, the financial statements may need to be prepared using a different basis, in which case the basis is disclosed.

Consistency

To maintain the comparability of a corporation's financial statements throughout time, accounting standards are applied consistently from one period to the next; modifications to an accounting policy are often only made in very rare circumstances.

Featured in Financial Statements

Characteristics are the elements that make the information in financial statements meaningful to users. The four primary qualitative characteristics are, in fact, applicability, reliability, comparability, and understanding.

Understandability

A key element is customers' ability to understand the information provided in financial statements quickly. Users are assumed to have studied the material with a reasonable level of attention and to have a fair comprehension of accounting, business, and economic activity for this purpose. Information on complex subjects that need to be included in financial statements because it is necessary for users to make economic decisions should not be removed only because certain users may find it difficult to understand.

Relevance

For information to be useful, it must be relevant to the criteria consumers use to make choices. Information has the quality of relevance when it influences users' economic decisions by helping them assess past, present, or future events or by validating or revising their earlier judgements. Both confirmatory and predicative aims may be served by information. When seeking to predict an organization's potential to grasp opportunities and adapt to difficult conditions, users may find it helpful to know the size and structure of current asset holdings. The same data provides support for prior predictions, such as those about the structure of the company or the outcome of planned actions. Information about past performance and economic position is frequently used to make predictions about future financial position and performance, as well as other issues in which users have a direct interest, such as dividend and wage payments, end-share price movements, and the company's ability to fulfil its obligations as they become due. Information may be predictive even if it doesn't explicitly make a forecast. Yet, the manner in which information about prior occurrences and transactions is shown enhances our ability to forecast using financial statements. For instance, the predictive value of the statement of profit and loss was improved when unusual, aberrant, and rare parts of income and expenditure were disclosed separately. The materiality of information affects its relevance. Such information is regarded as important if an erroneous statement or omission might have an impact on the economic decisions users make based on financial information. Its materiality is established by the scope and nature of the product or error as revealed by the particulars of its misrepresentation. Materiality gives a threshold or cut-off point rather from being a primary qualitative quality that the information must possess in order to be useful.

Reliability

For information to be useful, it must also be accurate. Information has the quality of dependability when it is free from bias and significant inaccuracies and can be trusted by users to accurately reflect what it either purports to represent or may be anticipated to suggest. Even though the information is significant, interpreting it could be misleading due to the style or manner in which it is presented. For instance, if the validity and amount of a claim for damages are highly disputed, it may not be appropriate for a corporation to record the amount of the claim in the balance sheet, but it may be okay to disclose the amount and circumstances of the claim.

Information must correctly reflect the transactions and other events it either represents, or that it may be reasonably anticipated to represent, in order for it to be regarded a faithful representation. For instance, a balance sheet must correctly record all transactions and other activities that satisfied the recognition requirements that resulted in the enterprise's assets, liabilities, and equity anywhere at the reporting date. Most financial information has the risk of not accurately reflecting what it purports to be. This isn't due to any bias; rather, it's because selecting the events and transactions that should be evaluated as well as creating and using measurement and presentation strategies that can convey signals related to those

occurrences and transactions offer intrinsic difficulties. Despite the fact that most companies develop goodwill both internally and externally over time, it is sometimes difficult to determine or assess whether goodwill is reliable. In certain instances, the measurement of a product's revenues and costs may be so ambiguous that most organisations simply wouldn't include them in their financial statements. It could be required to identify items and disclose the mistake risk involved in their measurement and identification in other situations, however.

Over substance Form

If information is to correctly reflect the transactions and other events that it purports to represent, it must be accounted for and presented in accordance with their substance and economic reality, not simply its legal form. It's common for the substance of transactions or other happenings to be different from what might be inferred from their fictional or legal form. For instance, when rights and beneficial interests in real estate are transferred but the paperwork and legal procedures are still pending, the transaction is essentially reflected by the recording of acquisition/disposal (by the beneficiary and transferor, respectively).

Neutrality

To be believed, financial statement information must be objective, or free from bias. Whenever financial statements choose or present information in a manner that affects judgement or decision-making in order to achieve a certain outcome or consequence, they aren't actually objective.

Prudence

Financial statement creators must include a variety of risks, including the ability to collect receivables, the estimated lifetime of equipment, and prospective warranty claims. The disclosure of these risks' nature and scope as well as the use of care throughout the financial statement preparation process reflect an acknowledgement of these risks. Prudent decision-making requires using a certain level of caution when producing estimates under ambiguous conditions in order to avoid overstating assets or income and understating liabilities or expenses. However, exercising caution forbids certain actions, such as the establishment of unreported reserves or excessive provisions, the intentional understatement of assets or income, or the intentional overstatement of liabilities or expenditure, as these would prevent the financial statements from being neutral and, as a result, would prevent them from having the quality of reliability.

Limitations on Reliable and Useful Information

Timeliness

Overly extended periods of time may cause information to lose its relevance. Management may need to consider the relative benefits of early reporting and the provision of correct information. It may often be necessary to submit information before fully comprehending all the specifics of a transaction or other situation, which lowers credibility. The data may be quite accurate, but users who had to make decisions in the interim would not profit much if reporting was delayed until all pertinent information was available. Finding a balance between relevance and reliability should be primarily driven by how to satisfy customers' information needs successfully.

Comparability

Users must be able to compare the financial statements of the firm over time in order to see trends in the financial status, performance, and cash flows of an organisation. Users must be

able to compare the financial statements of the various firms in order to evaluate the relative financial status, performance, and cash flows of those businesses. The financial effects of comparable transactions and other events must thus be quantified and presented consistently throughout a business, across time, for one firm as well as consistently for numerous businesses. A critical corollary of the qualitative quality of comparability is the need that users be informed about the accounting rules employed in the preparation of the financial statements, subsequent changes to those policies, and the effect of those changes. Consumers must be able to tell the difference in accounting practises used by the same company over time as well as by other firms for the same transactions and other events. Compliance with accounting standards, including disclosure of an enterprise's financial accounting, is crucial to ensuring comparability. To avoid putting up a roadblock for the adoption of higher accounting standards, it is crucial to differentiate between the necessity for comparability and mere conformity. A corporation should not continue to account for a transaction or other event in the same manner if the selected policy does not uphold the qualitative attributes of relevance and reliability. Moreover, it is unethical for a company to continue using its accounting procedures when more rational and reliable alternatives are available. Users want to be able to examine the cash flows, performance, and financial position of a business over time. Hence, it is imperative that possibly pertinent information about the preceding quarter be included in the financial statements (s).

Keeping Cost and Benefit in Check

The balance between cost and benefit, rather than being a distinguishing trait, is a common restriction. Information should be made available at a cost larger than the benefits it brings. Yet, weighing benefits and costs is mostly an arbitrary process. Moreover, not all users who get benefits are required to pay for them. Other users may gain from the content in addition to the intended audience. These considerations make it difficult to do a cost-benefit analysis in every circumstance. Nonetheless, individuals who establish standards as well as those who produce and use financial statements in general should be aware of this constraint.

Equilibrium between the many qualitative traits

In reality, it is sometimes necessary to strike a balance between qualitative qualities, or to make a trade-off. In order to achieve the aim of financial statements, it is often desired to find an appropriate balance between the elements. The proportional importance of the qualities in different contexts must be determined using professional judgement.

Fair and True Perspective

Financial statements are often described as giving a true and fair representation of an organization's financial position, operational performance, and cash flows. Financial statements that convey what is often seen as an honest and fair view of such information are generally generated by employing the major qualitative aspects and relevant accounting rules, even if such ideas are not directly addressed in this Framework.

CHAPTER 14
CHARACTERISTICS OF NATIONAL DEFERENCE IN ACCOUNTING

[1]Dr. Sireesha Nanduri, [2]Yashoda L
[1]Assistant Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Assistant Professor, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]sireesh_n@cms.ac.in, [2]yashoda@cms.ac.in

Based on objective factual and historical investigations into accounting as it is, as opposed to what it is believed to be, many, if not most, of these assessments have given very little care to the actual practices of accounting. This is true whether evaluations are undertaken using more psychologically based approaches of characterizing national attitudes and behaviour or rather basic and sometimes extremely questionable comparisons of the subservient roles played by governments and markets. Solving these problems would enable a thorough institutional and sociological analysis of Nancie accounting.

The dynamics of deference, change, and consequences may be better understood via an analysis of financial accounting, but doing so requires conceptual and theoretical complexity as well as a thorough knowledge of and respect for Nancie accounting in use. Let's quickly explore recent changes in German legislation controlling financial accounting to provide some perspective for what such an audit might find.

Contrary to previous institutional and social characterization studies of German financial accounting practitioners who had highlighted their own deeply ingrained determinants and profound cultural influences, observations of practice have shown an impressive pace of change in both reporting practices within the frame of reference of the quite significant discretion provided by the law and change inside the regulatory structures connected with the nancial financial reporting craft. Instead of looking for ideas of stability and permanence, it is vital to obtain insights into how, at the very least, certain German accounting systems may adapt fast to contextual change.

It is crucial to pay particular attention to how accounting discretion is allocated and used, the relationships between corporate financial officers, auditors, and social workers within regulatory agencies, as well as how concepts of good accounting emerge, disseminate, and change over time. These incidents demonstrate the steady rate of change that financial accounting techniques are subject to. Even in a particular national context and even when a large number of ostensibly crucial influences of national practises of financial accounting remain largely unchanged, the determination of corporate surplus as well as the accounting practises but rather bodies of knowledge involved in this appear to be able to and do react quite quickly to changes throughout the conjuration of socio-economic interests within and surrounding the enterprise. Making arguments for corporate governance and understanding the possible roles that various governance systems may play in the development of accounting procedures are two ways to partially address these issues. While emphasising a crony capitalist view of shifting forces at work within the company and paying little to no attention to the less formalised but no less significant pressures that can have an impact on the company, it would appear that the concept of corporate governance is primarily useful for this one.

Financial Statement Components

Financial statements divide transactions and other occurrences into broad groups based on their economic qualities in order to portray the financial effect of those transactions and other events. These primary categories are referred to as the "components of financial statements." The three categories that directly affect how the balance sheet measures financial situation are assets, liabilities, and equity. The elements of the profit and loss statement that are directly related to performance assessment are income and expenses. This Framework does not define any aspects that are special to the cash flow statement because it often includes components of the statement of financial position including changes in balance sheet items. 48. A process of sub-classification is employed to display these components in the balance sheet as well as the profits and losses statement. In order to give information in a manner that is most relevant to users for the goal of making economic decisions, assets and liabilities, for instance, may be classified according to their kind or position in the operations of the organisation.

Financial Position

Equity, liabilities, and assets are the three categories that are most closely related to determining financial condition. They are defined as follows: An asset is a resource that the company has control over as a result of previous commercial dealings from which it expects to reap future financial benefits. A liability is a present obligation of a company that was brought on by a past event and whose resolution is expected to require the company to invest resources that will result in financial advantages. Equity is the portion of the company's assets that remains after all debts have been settled. When deciding whether an item meets the requirements of an asset, liability, or equity, consideration of the thing's underlying substance and economic reality should be given priority over consideration of the object's legal form alone. For instance, in a hire-purchase agreement, the buyer receives the financial benefits of utilising the asset in return for agreeing to pay an amount that is generally equal to the item's fair market value plus any applicable financing charges. As a consequence, the hire purchase generates items that may be classified as an asset and an obligation and are shown as such in the hire purchaser's balance sheet.

Assets

The potential future economic benefit inherent in an asset is its ability to contribute, either directly or indirectly, to the flow of cash and cash equivalents towards the firm. The possibility may be one that positively impacts the business's operational processes. If a revised manufacturing method leads in lower production costs, it may also be converted into cash or cash equivalents or it may reduce cash outflows. A firm often utilises its assets to produce goods or services that can satisfy the needs or wishes of its customers. Since these goods or services can satisfy customers' needs or desires, customers are prepared to pay for them, which improves the business's cash flow. Cash itself gives the firm a service since it has influence over other resources. The corporation may get the potential economic benefits of an asset in a number of methods. To create goods or provide services that the company will sell, an asset may be employed alone or in combination with other assets. It may also be exchanged for other assets, used to settle obligations, or donated to the company's owners.

Many assets, including machinery and plant, have a distinct physical form. For instance, patents and copyrights are assets if the corporation has ownership over them and expects long-term economic benefits to flow via them. Yet, an asset may exist without having a physical embodiment. The right to ownership is one of several legal rights that are connected to a variety of assets, including receivables and real estate. A hire-buy item is an example of

an asset of a hire purchaser since right of ownership is not required to establish the existence of an asset because the hire purchaser chooses the benefits that are expected to emerge from the item. Even in the lack of legal power, an item may nonetheless match the definition of an asset even though legal rights often provide an organisation the capacity to administer benefits. For instance, a piece of information may meet the definition of an asset if a firm controls the benefits that are projected to come from keeping it secret. The assets of a business are the result of earlier transactions or other events. Assets are often obtained by businesses via acquisitions or production, but they may also be produced as a consequence of other transactions or occurrences. Examples include getting government-provided land as part of a plan to support local economic growth or finding mineral riches. Transactions and other expected future events do not produce assets; for instance, the desire to purchase goods does not establish an asset in and of itself. While they are closely tied, spending money and building up assets do not necessarily go hand in hand. Consequently, when an organisation makes a purchase, it may indicate that it hopes to benefit financially in the future, but this is not definite confirmation that an asset has been bought. Similar to this, the absence of a related expenditure does not preclude an item from fulfilling the criteria for an asset and, as a result, from being a candidate for recognition primarily in the balance sheet.

Liabilities

One of the basic qualities of a duty is a present obligation. An obligation is a duty or responsibility that requires one to act or perform in a certain way. The impact of making commitments legally enforceable may result from a legally binding contract or legislative necessity. For instance, when payments are due for goods and services obtained, this is often the case. The need to preserve good working relationships, custom, corporate practise, behaving equitably, or other reasons may also result in duties. Liabilities include amounts that are projected to be spent on goods that have already been sold, such as when a company decides to correct product faults even after they become apparent after the warranty period has ended out of policy. It is necessary to distinguish between a present obligation and a commitment for the future. A present obligation is not automatically created by a management decision to buy a future asset. The majority of the time, an obligation won't begin until the asset is transferred or the company agrees to an irrevocable purchase agreement for it. In the latter case, the irreversible nature of the agreement means that the corporation has little, if any, discretion to stop the flow of resources to a third party since there are financial repercussions for breaking the obligation, such as a substantial penalty. The corporation would often give up resources that offer economic benefits while satisfying a current commitment in order to satisfy the claim of an opposing party. The payment of cash, transfer of those other assets, provision of services, replacement of another obligation in its place, or (e) conversion to equity are all possible methods of satisfying a current obligation. A creditor may also cancel a debt by reneging on their rights or waiving them.

Financial Statement Components

Equity

Equity may be subclassified on the balance sheet even if it is classified as a residual. For example, reserves indicating capital maintenance adjustments, misappropriated retained earnings, owner contributions, and reserves reflecting retained earnings appropriations may all be displayed separately. Such categories may be relevant to the decision-making needs of the readers of financial statements when they indicate any legal or other restrictions on the enterprise's ability to distribute and otherwise utilise its equity. They could also serve as a reflection of the fact that individuals or groups that own ownership interests in a certain firm may have different rights regarding dividend payments or capital returns. Legislation may

sometimes require the creation of reserves to provide the business and its creditors more protection from the effects of losses. Reserves may also be created in cases where tax laws provide exemptions or reductions in tax liabilities in exchange for transfers to such reserves. Knowledge about the existence and extent of such reserves may be relevant to the needs of users in terms of decision-making. Transfers to these reserves are really distributions of preserved earnings rather than expenses. How much equity is shown on the balance sheet depends on how both assets and liabilities are measured. The whole quantity of equity often only matches by happenstance with the complete market value of the firm's shares or the amount that might be realised by selling the company as a going concern or the overall wealth in its entirety. Businesses typically conduct commercial, industrial, and business activities, including sole proprietorships, partnerships, trusts, and other types of government commercial enterprises. Unlike corporate enterprises, these businesses often operate under a different legal and regulatory context. In contrast to corporate businesses, there could be few, if any, restrictions on the transfer of equity money to owners or other beneficiaries. Yet, for these kinds of organisations, the Framework's idea of equity as well as other equity-related components are appropriate.

Income

The definition of income includes both revenue and profits. The many types of income that are earned from an enterprise's regular activities include sales, fees, interest, dividends, royalties, and rent. Gains are extra items that are included in the definition of income and may or may not be produced during regular company activities. Gains mirror increases in economic benefits, making them equivalent to income in nature. They are thus not regarded as a separate element in this Framework. The concept of income includes unrealized gains. Profits might also result from selling fixed assets, for example. As it's crucial to be aware of gains while making financial decisions, gains are often broken out into different columns when they're reported in the profit and loss statement. Many assets, including cash, receivables, and goods and services bought in exchange for goods and services rendered, may be purchased or increased with the help of income. As a result of revenue, debts may also be paid off. As an example, a company could provide goods and services to a borrower in return for the obligation to repay a debt that is still outstanding.

Expenses

The notion of expenditures includes both losses and costs incurred during regular company operations. In the course of the company' routine operations, costs such as the cost of goods sold, staff pay, and depreciation may arise. They appear as a reduction in resources, a loss of assets, or an increase in responsibilities. Losses are extra expenses that might or cannot happen during regular company operations. They come under the area of expenditures. As losses represent decreases in economic benefits, they are no different from other expenses in nature. They are not regarded as a separate component of the Framework as a consequence. In addition to losses caused by natural disasters like fire and flood, losses may also result from selling fixed assets. The notion of expenses also includes unrealized losses. When losses are recorded in the statement of profits and losses, they are often stated separately since comprehending losses is crucial for making economic decisions.

Recognizing Financial Statements' Components

A thing must be included in the balance sheet or statement of profit and loss in order to be recognised as anything that meets the requirements for recognition and matches the definition of an element. It requires stating the item in words and in monetary terms, adding that amount to the sums on the balance sheet or the statement of profits and losses, and then completing

the statement. The balance sheet or profit and loss statement should include items that are eligible for recognition. The addition of notes or other explanations, together with a description of the accounting techniques used, do not make up for a lack of understanding of such matters. If an item fits the requirements of an element, it is probable that any associated future economic gain will flow to or benefit the organisation, and it has a cost or value that can be precisely determined, then it should be recognised. When deciding whether an item fits these criteria and is thus eligible for recognition within the financial statements, attention must be given to the materiality factors. Any item that fulfils the description and recognition criteria for one element, such as an asset, also requires the recognition of other elements, such as income or a liability, due to the dependency between the components.

Future Economic Benefits' Likelihood

When describing the degree of uncertainty that even the item's possible future economic advantages will flow to or from the company, the recognition criteria use the concept of probability. The concept fits with the uncertainty existing in the environment that an organisation operates in. Assessments of the degree of uncertainty related to the flow of future economic benefits were made based on the information available at the time the financial statements were issued. For instance, assuming no additional evidence to the contrary, it is reasonable to categorise a receivable as an asset when it is expected that it would be realised. Yet, a big population of receivables makes it common to assume that some non-payment would occur; as a consequence, an expense denoting the projected loss of economic benefits is recorded.

Assurance of Measurement

A thing must also be able to be appropriately valued or priced in order to be recognised. Estimating cost or value is a common need; it is an essential stage in the production of financial statements and does not weaken their reliability. Use only estimations that are reasonable. Nevertheless, if a reasonable estimate cannot be made, the item is not included in the balance sheet or the statement of profit and loss. The claim should not be regarded as a liability or an expense if it is not possible to properly quantify it. As an example, the compensation awarded in a lawsuit may satisfy the requirements for both a liability and a cost as well as the likelihood requirement for recognition. An item that does not now meet the criteria for recognition may become so in the future if certain circumstances or events take place. It could still be essential to reveal anything in the notes, explanation, or supplementary schedules even if it doesn't satisfy the criteria for recognition but still satisfies the fundamental requirements of an element. This is appropriate if the users of financial statements think that understanding the item would enable them to assess the enterprise's financial health, operating efficiency, and cash flow [1].

Understanding of Assets

An item is classified as an asset on the balance sheet when it is anticipated that the firm will benefit from the related economic benefits today and the asset seems to have a cost or value that can be calculated properly. An asset is not recognised on the balance sheet when a cost is incurred for which it is deemed unlikely that economic benefits would flow to the company beyond the current accounting period. Instead, a transaction like this results in the profit and loss statement recording a cost. This strategy does not imply that management was in error or that their goal in incurring costs was anything other than to secure the company's future financial advantages. The lone finding is that there is insufficient confidence in the company's ability to continue reaping financial benefits beyond the current accounting period to support asset recognition.

Identification of Obligations

A liability is documented in the balance sheet when it is probable that a resource outflow reflecting economic benefits would result from the settlement of a current obligation and when the amount by which the settlement would take place can be precisely predicted. In reality, even if they are disproportionately unperformed, obligations for orders of goods that have not yet been received are sometimes not recorded as liabilities within the financial records. Such obligations could, nevertheless, be eligible for recognition and fulfil the definition of liabilities if the circumstances are right and the prerequisites for recognition are met. When this happens, it is necessary to recognise the related assets or expenses in addition to the liabilities.

Acknowledgement of Income

Income is recorded in the statement of profit and loss whenever a rise in future economic benefits associated with an increase in an asset or a decrease in a liability has happened and can be estimated with accep precision. This successfully shows that revenue recognition occurs simultaneously with the acknowledgment of asset growth or liability decrease (for instance, the reduction in liabilities brought on by the cancellation of a debt owed or the net gain in assets resulting from the sale of products or services). The procedures that are often used in practise for recognising income, such as the requirement that money be earned, are applications of the recognition criteria throughout this Framework. These techniques often seek to restrict the designation of products as income to those that can be precisely measured and in which there is a high enough degree of confidence.

Acknowledgement of Costs

Expenses are recorded within the statement of profit and loss when a decline in future economic benefits linked to a decrease in an asset or an increase in a liability has formed and can be assessed with accep precision. This effectively shows that the recognition of an increase in liabilities or a decrease in assets occurs simultaneously with the accrual of expenditures (such as the depreciation of equipment and plant). Several costs are recorded within the profit and loss statement due to a distinct association between the expenses incurred and the receipt of certain pieces of income. The "mapping of costs with revenues" is the immediate or combined recognition of revenues and expenditures that arise directly and/or jointly from the same transactions or other events. For instance, both the revenue from the sale of the items and the numerous costs that make up the cost of goods sold are recognised at the same time. Nevertheless, the matching concept cannot be used to the balance sheet to identify items that do not meet the requirements of assets or liabilities. When economic benefits are expected to occur across a number of accounting periods and the link with revenue can only be assumed or guessed at, expenses are reported in the statement of profits and losses based on systematic and logical allocation methodologies. This is often necessary in order to identify the expenses connected to the depreciation or amortisation of assets like machinery, goodwill, patents, and trademarks that wear out over time.

These techniques of allocating costs are created to take into consideration expenses in the financial periods when the associated economic gains are exhausted or lost. Costs that have no immediate economic benefits are promptly recorded in the profit and loss statement. When future financial gains from a cost are no longer eligible for recognition as an asset on the balance sheet, the cost is also recognised to that extent. A cost is also documented in the profits and losses statement when a liability arises even without the recording of an asset, such as when a service agreement's obligation is involved. When spending should be reported in a company's financial accounts is defined by the expenditure recognition principle, which

is a theory. The notion of expenditure recognition often requires that expenditures be recognised and recorded concurrently with revenues connected to those costs (under accrual accounting). Companies may use this accounting method to reconcile certain expenditures with the revenues related to those costs (For instance, commissions due to staff members for certain sales reported immediately rather than later). To put it another way, it shows how the business consumes assets and converts them into expenses when their usefulness is exhausted. The timing of when expenses should be recorded is the main contrast between accrual and cash accounting. Cash accounting is the practise of documenting costs as they are incurred rather than recording revenue and expenses at the same time.

Measurement of Financial Statement Components

The process of measuring seems to be determining the monetary values at which the elements of financial statements should be recognised and reported in the balance sheet and statement of profit and loss. Here, the selection of a particular measurement basis is important. A number of measurement bases are used in financial statements, each to a different extent and in different combinations. The following is a list of them:

Cost in the past

Assets are evaluated at the cash, cash equivalents, or fair market value of the extra consideration received at the time of acquisition. Liabilities were calculated as a percentage of revenues gained in return for the obligation, or as the amount of cash or cash equivalents expected to be paid to satisfy the obligation in the regular course of business, for certain obligations (such income taxes).

Current price

Assets are valued at what would need to be paid in cash or cash equivalents today if the same asset or one with a comparable value were to be purchased. The undiscounted amount of money or cash equivalents required to fulfil the commitment at the current time is what is known as the carrying amount of liabilities.

Value at Realisable (Settlement)

The amount at which assets are carried is the maximum amount of cash or cash equivalents that might currently be realised by promptly selling the asset. Current settlement values, which correspond to the undiscounted amounts of cash and cash equivalents expected to be required to fulfil the liabilities in the normal course of business, are used to report obligations.

Current worth

Assets are generally carried someplace at the present value of the anticipated future net cash inflows. Liabilities were recorded at their current value, which represents the expected future net cash outflows required to settle them in the normal course of business. Businesses most often base their measurements on historical cost when preparing their financial accounts. It often functions with other measurement bases. For instance, inventory is often reported at the lower of cost or net realisable value, and pension liabilities are typically reported at their current value. The current cost base may be used as a workaround since the historical cost accounting technique may not be able to address the effects of changing prices for non-financial assets [3].

Investment Maintenance

A company's earnings shouldn't be recognised until it has fully recouped its expenses or has maintained its capital, according to the accounting concept known as capital maintenance,

sometimes known as capital recovery. When a company maintains its capital, the amount of capital it has at the end of a period is the same as it had at the beginning. Any excess above this represents the company's profit. Financial capital upkeep only considers the actual money available at the start and end of a certain accounting cycle, excluding the value of numerous other capital assets.

Capital Maintenance Types

There are two distinct categories for capital maintenance:

Maintenance of Financial Capital

According to the principle of financial capital maintenance, a company only turns a profit if the total of its net assets at the end of a period is higher than the total at the beginning of that period. None of the owners' contributions or payments are included in this. Both nominal monetary units and continuous buying power units may be used to measure it. Financial capital maintenance only considers the actual money available at the start and end of a certain accounting cycle and does not take into consideration the worth of numerous other capital assets. The two viewpoints on financial capital maintenance seem to be monetary financial capital maintenance and real financial capital maintenance. If the ending net assets are more than the beginning net assets, both valued at historical cost, profit is determined under money financial capital maintenance. The term "historical cost" refers to the value of the assets at the time the company paid for them. If the ending financial worth is more than the beginning net assets, both valued at current prices, profit is determined under real economic capital upkeep.

Physical Capital Upkeep

The cost of the required maintenance on physical things, especially equipment, is unimportant to physical capital maintenance. On the other hand, it focuses on a company's ability to continue generating cash flows by maintaining access to assets that are currently being utilised as a component of the firm's infrastructure. According to the idea of physical capital maintenance, a company only makes money if, after any owner contributions or dividends, its productive or operational capacity at any point throughout a period is greater than it was at that point in time. A company's earnings shouldn't be recognised until it has fully recouped its expenses or has maintained its capital, according to the accounting concept known as capital maintenance, often referred to as capital recovery. The capital maintenance principle states that a company can only be said to be profi if all of its operational costs are paid for a certain accounting period. The two primary forms of capital maintenance seem to be financial capital maintenance and physical capital maintenance. It could be required to update asset valuations to determine if a firm has maintained capital during times of strong inflation.

Inflation's Impact on Capital Maintenance

A high rate of inflation, especially if it has occurred over a short period of time, may affect a company's ability to determine whether it has successfully completed capital maintenance. A company's net assets may grow in value along with prices. Yet, this rise could not have correctly represented the underlying value of the company's assets. As a consequence, a company may need to adjust the value of its net assets during periods of inflation in order to determine whether or not it accomplished capital maintenance.

Maintenance of Capital and calculating Profit

Capital may be thought of in two ways: financially and physically. The company's net assets or equity are the definition of capital under the financial notion, but the definition under the physical concept is the company's productive capacity expressed in some physical units of

measurement, such as the number of units produced per day. An organisation should choose the appropriate capital concept based on the needs of the users of its financial statements. The financial idea of capital should thus be understood and used by those who use financial statements and are primarily concerned with the preservation of nominal invested capital or even the purchasing power of invested capital expressed in monetary measurement units. The physical capital notion, on the other hand, is used when preserving the physical productive capacity is the key priority. Choosing the capital maintenance concept has the following effects: The physical capital maintenance technique must be utilised in conjunction with the current cost foundation of measurement. The concept of financial capital maintenance does not require the adoption of a particular measuring foundation; instead, it is based only on the kind of underlying financial capital that is desired to be maintained. The essential difference between the two lies in how the effects of changes in the price of the enterprise's assets and liabilities are managed. The key difficulty with capital maintenance in accounting is determining the value difference between the invested resources' valuations at the beginning of the accounting period and their values as recorded in the balance sheet at the end of the accounting period—i.e., profit or loss. For the profit or loss to be calculated as the difference between the resources present at the beginning of the accounting period and the resources available, the key need is that they utilise the same unit of measurement, namely numerique. If the available resources are not defined using the same fair value valuation bases (for example, if the inputs were valued in USD and the outputs in EUR), the profit or loss resulting from their discrepancy is reported in different units of measurement.

Upkeep of financial capital

This theory states that a profit can only be realised when the financial (or money) amount of a net asset somewhere at the end of the period exceeds this same financial (or money) percentage of the net asset at the beginning of the period after subtracting any distributions to and contributions from owners during the period. The cost of maintaining financial capital may be measured using both nominal currency units and units of continuous purchasing power.

Physical capital upkeep

This theory states that a profit is only realised when the enterprise's physical productive production capability (or required to operate capability) at the end of the period exceeds this same physical productive capacity there at the beginning of the period after deducting any distributions to and contributions from owners during the period. The concept of capital maintenance revolves on how a firm identifies the capital it wants to maintain. It is essential to create a benchmark for profit in order to differentiate between a company's present return on capital and its return of capital. Profit and, thus, a return on capital can only be regarded as asset inflows that are bigger than the quantities necessary to sustain capital. So, the amount that remains after expenditures (including, if required, capital maintenance adjustments) have been deducted from revenue is referred to as profit. If expenses outweigh income, the balance is a net loss. The physical capital maintenance technique must be utilised in conjunction with the current cost foundation of measurement. The concept of financial capital maintenance does not, however, require the use of a particular measuring base. A basis for this idea will be selected based on the kind of financial capital that the corporation hopes to keep.

The primary difference between the two concepts of capital maintenance is how the effects of changes in the price of the enterprise's assets and commitments are addressed. If, in general, a company's capital remains at the same level it did at the beginning of the term, it has maintained its capital. Profit is defined as any sum that is more than what is required to maintain the capital at some point in the period. Profit is the increase in nominal money

capital during the period when maintaining financial capital was the primary goal, with capital being defined in nominal currency terms. So, holding gains—increases in the value of assets kept during the period—are technically profits. They could not, however, be recognised as such until the assets were sold as part of an exchange transaction. When the notion of maintaining financial capital is expressed in terms of continuous spending power units, profit is the increase in invested purchasing power over time. Hence, profit is only regarded to be that percentage of the increase in asset values that surpasses the overall rise in price levels. The balance of the increase is treated as a capital maintenance adjustment and is thus accounted for as equity. Profitability is the increase of capital over time while keeping in mind the principle of maintaining physical capital. Capital is defined in terms of the physical productive capability. As a consequence, any price changes that have an impact on the company's assets and liabilities are categorised as capital maintenance adjustments, which are represented in equity rather than profit as they alter how the company's physical productive capacity is calculated. The measurement bases and capital maintenance strategy utilised will determine the accounting model used to compile the financial statements. Managers must attempt to balance the relevance and reliability of the many accounting models, each of which demonstrates varied degrees of both, much as in other fields. This Framework, which may be used with a broad variety of accounting models, provides instructions on how to create and present the financial statements using the chosen accounting model.

Fair Value Measurement

According to IFRSs, certain assets, liabilities, and equity instruments must be valued at fair value under specific circumstances. For determining fair value, the IFRSs provide sporadic and inconsistent guidance, which cannot be disregarded. The current definition of fair value under the IFRSs is described as "the price at which an asset may be transferred, a debt paid, or an equity instrument given, between knowledgeable, willing participants in an arm's length transaction." As the fair value is a market value rather than a specific value for the firm, it must be determined with the assumption that it is a price that market players would accept. It has been used to set the following standards in a hierarchy: quotes for costs taken from active markets. If it is available, the following data must be included in a valuation approach when there is no active market: refers to the most recent market transaction's close equivalent of some other instrument's fair value. models for option pricing, such as discounted cash flow analysis (present value). the reporting company's own assessments of the market value of its own obligations and assets (unobservable inputs). With respect to this, "the company follows the valuation technique that is typically used by market participants when pricing this similar instrument and that has demonstrated to produce trustworthy estimates of values determined in actual market transactions." The process of valuation is complex and involves estimates and assumptions, making it somewhat subjective and obviously open to management interpretation.

CHAPTER 15
ACCOUNTING SYSTEM

[1]Pujari Sudharsana Reddy, [2]Umakanth S
[1]Assistant Professor, Department of Finance, CMS Business School,
Jain (Deemed to-be University) Bangalore, Karnataka, India
[2]Professor& HOD, Department of Management,
Jain (Deemed to-be University) Bangalore, Karnataka, India
Email Id-[1]pujarisudharsana_reddy@cms.ac.in, [2]umakanth@cms.ac.in

Professional accountants examine a company's accounting records and reports from two angles. They refer to these two points of view as management accounting and financial accounting, respectively. You may learn more about the two views and how they vary from one another by consulting Wikipedia. ” The area of accounting known as financial accountancy, often known as financial accounting, is concerned with the creation of financial statements for decision-makers, including owners, workers, suppliers, banks, and other stakeholders. By evaluating and tracking agents' performance, reducing the principal-agent dilemma, and informing interested parties of the findings are the core purposes of financial accounting. Financial accounting is used to create accounting data for those outside of the organisation or uninvolved in the day-to-day operations of the business. Financial accounting, in essence, is the process of condensing financial information from an organization's accounting records and disseminating it to the public in the form of yearly reports or more often. International and national accounting standards both control financial accounting. Financial accounting records and financial statements are also critical sources of data for tax return preparation.

The provision and use of accounting information by managers within organisations, on the other hand, is the focus of management (or managerial) accounting. This is done to give managers the information they need to make wise business decisions that will help them perform their management and control duties more effectively. In contrast to financial accounting information, management accounting information is typically private and used by management rather than being disclosed to the public, is calculated pragmatically using sophisticated management information systems and internal controls rather than adhering to accounting standards, and is typically forward-looking rather than historical. This is due to the focus being placed differently: management accounting data is utilised internally by organisations, often for decision-making.

While your company is first getting started, you won't need to worry too much about financial accounting since the information you'll need comes under the category of internal management information rather than information for external stakeholders. Also, keep in mind that financial accounting reports need to be created in compliance with both national and international accounting standards. Since 1973, the Financial Accounting Standards Board (FASB) has served as the recognised independent body for accounting reporting standards in the United States. Independent auditors are required to certify in writing in their report that the financial statements of an organisation were produced in compliance with generally accepted accounting principles (GAAP). The FASB will often prescribe how such information should be presented, even though there are theoretically numerous ways to convey accounting information on subjects like corporate mergers, events that occur beyond the date of an audit, the fair value of financial instruments, and the like. Visit the FASB website at http://www.fasb.org for further details.

A relatively new institution, the International Accounting Standards Board (IASB), has emerged on the scene since so many businesses have a worldwide focus. Its goal statement is to "create, in the public interest, a single set of high quality, clear, and international financial reporting standards (IFRSs) for general purpose financial statements," according to their website (IASB 2009). Finally, your accountant should be knowledgeable about and, ideally, a member of the national association of accountants in your country once your company reaches the point where you need to release financial statements to external stakeholders (such as banks, stockholders, regulatory agencies, etc.).

As a result, the remainder of this focuses on how you may utilise an accounting system that is well-designed as the foundation for producing relevant information to aid in running your firm.

Simpler kinds of accounts

According to Wikipedia, a typical accounting system uses the following six main categories of accounts: account for assets obligation accounts equity statements Income or revenue accounts Contra accounts vs expenditure accounts

The discussion of each sort of account is below. We will talk about how they are utilised in an accounting system in the parts that follow in this chapter.

Asset accounts: These account types reflect the many economic resources that a company has; typical examples include cash, cash in the bank, inventory, equipment, buildings, prepaid rent, goodwill, and accounts receivable. Current assets, fixed assets, and intangible assets are the three categories into which assets are often divided. Current assets are those that, if needed, might be turned into cash relatively quickly—certainly in less than a year. Cash, cash on hand, inventory, prepaid rent, and accounts receivable are a few examples of current assets. Fixed assets are possessions that are more long-term in nature, such as manufacturing machinery, owned buildings, and the like. A monetary value is attributed to intangibles like a brand name and is known as an intangible asset, or goodwill. It is often used by accountants to support the acquisition price of a firm when the price cannot be supported by the financial worth of the assets minus liabilities of the bought company. The discussion of intangible assets is beyond the purview of this since they are more relevant to established businesses than to start-ups.

Accounts for liabilities serve as a representation of the many financial commitments that a company has, including accumulated interest, bonds due, bank loans, and accounts payable. Current liabilities are obligations that are expected to be paid off quickly, often in less than a year. Accounts receivable to creditors like suppliers, current payments owed to workers (payroll), and interest on short-term loans are a few examples of current liabilities. Liabilities of a more permanent type, such as loans that are not due in the current year (long-term debt), and the like, are referred to as long-term liabilities (also known as fixed liabilities).

Equity accounts: show a company's remaining equity (after deducting from assets all the liabilities). It is sometimes referred to as owner's equity and refers to the money that the owner contributed to a start-up business that was entirely funded by the creator. It is often referred to as stockholders' equity if the business is a corporation and stock has been issued to the owner and other shareholders.

The company's gross income, before costs are subtracted, is represented by revenue accounts or income. Sales, service fees, commissions, and interest income are typical examples.

Expense accounts: show the costs incurred by the business to run. Employee expenses (payroll and fringe benefits), supplies, software, phone bills, power and water bills, rents,

depreciation, bad debt, interest, and insurance are typical examples. Contra-accounts, which derive from the word ciccia, which means to subtract, are the antithesis of the other five categories of accounts stated above. For instance, cumulative depreciation is an example of a contra-asset account. This designation denotes reductions to an asset that is comparatively permanent, such as a building. It accrues an annual charge in acknowledgment of the fact that a fixed asset like a building has a useful life measured in numerous years and is not consumed over the course of a single year. A vehicle bought for use in the company could be a better illustration as real estate tends to consistently increase in price in certain nations and under certain economic circumstances. It's worth is more likely to keep declining over time. Accountants will nevertheless deduct an annual depreciation charge from the worth of a building even if its market value may rise over time rather than fall. From the owner's viewpoint, this is a fantastic illustration of how financial accounting and management accounting are different. In most nations, depreciation on a vehicle or building lowers revenue for tax reasons, therefore it benefits the owner to record depreciation expenses in the business's financial records. On the other hand, when the time comes to sell the building, you can trust that the owner is aware of its genuine market worth!

Since you want to make sure that accounts are set up in each category (such as assets, liabilities, etc.) that will allow you to aggregate accounting transactions in a meaningful manner, setting up an adequate chart of accounts will need some careful consideration on your part. You should think about the kind of information you will need to operate your firm as a starting point. After that, you may evaluate other sorts of data that may be necessary for financial reporting, as we previously covered. The simplest way to comprehend setting up a chart of accounts is to go through an example. Imagine a young businessperson who wants to open a men's apparel shop has to create a chart of accounts. An account number is often assigned to each account in a chart of accounts. This is equivalent to you having a special account number for businesses you do business with, like a bank or a phone provider. With a computerised customer accounting system, a number that uniquely distinguishes you from another client who could have the exact same name is more convenient to use. Similar to account numbers in a chart of accounts, account numbers in a computerised general accounting system are simpler to use and uniquely identify an account. It is typical to give each kind of account a range of numbers. The next step is to determine the split of accounts you need, so you can set up an account for the specific data you want for each kind of account. Starting with the asset account category, for instance, you can determine that you need to establish your company with at least these accounts: The same steps are taken with each kind of account until your chart of accounts is finished and includes all the categories you think you'll need to gather accounting data and organise it into useful categories.

Thankfully, you can find examples of charts of accounts per kind of company from a variety of sources, which you may use as a reference and a jumping off point. The national organisations (or institutes) of professional accountants that we previously mentioned in this might be one source of such information. Searching online for an example chart of accounts for your sort of company is another alternative. For instance, when we searched Google for a "Bed and Breakfast" (B&B) sample chart of accounts, we discovered a 98 page document that covers almost every topic a person looking to open a B&B should be aware of. Page 90 of the text includes a sample chart of accounts.

Fundamental financial statements

For now, let's focus on the two most basic statements of all, and we'll talk about some of the other sorts of reports you'll need to be able to make later in this to plan and manage your firm finances: the balance sheet and the income statement. The Income Statement is crucial since

it will let you know if your company was profi at any particular point in time. The balance sheet will outline your company's financial situation, including what you own, what you owe, and the ownership stake. The balance sheet is frequently referred to as the statement of financial condition, while the income statement is known as the profit and loss statement.

Just the terms "Cost of goods sold" and "gross margin" need further clarification. The overall price a company owner paid for the items sold is known as the cost of goods sold. If Bill's Bicycle Shop's owner merely purchases bicycles from the manufacturer and has them shipped to the store, the cost of a bicycle is whatever bill was paid to the manufacturer plus the cost of shipping it to the store and any labour costs that may be associated with putting the bicycle on display for customers to see. The entire expenditures related to all of the bicycles sold by Bill in 2009 are represented by the cost of goods sold (USD 8,000) on the income statement. The term "matching" in accounting refers to this. (The sales number of USD 20,000 is the sum of all customer prices paid for bicycles purchased from Bill throughout the year.)

The difference between sales and the cost of products sold is known as the gross margin. Business leaders often refer to their margins or "managing their margins" when discussing this crucial statistic. A company is more likely to be profi the higher the gross margin. Find out, for instance, what Bill's gross margin and profit would be if, due to competition, he had to sell his bicycles at a loss and his sales income for the year was USD 17,000 rather than USD 20,000.

It is clear why the document is called a balance sheet. That is thus because the totals of the asset accounts and the liabilities and owner's equity accounts must be equal. They must thus be in harmony. Also, it is clear why it is sometimes referred to as a statement of financial situation. It displays the company's financial standing as of a certain date. The development of double-entry bookkeeping, a method that greatly aids accountants and bookkeepers in ensuring the correctness of accounting records and the reports that are created from them, will be covered next. A brief history of accounting and double entry bookkeeping Although there are many different origin legends, most authors agree that accounting has a lengthy history that dates back at least 5,000 years. According to legend, affluent people who wanted to keep track of their assets (such as livestock, grain stockpiles, gold jewellery, and so on) paid scribes to record additions and deletions to their lists of possessions when they were purchased, sold, or exchanged. One may assume that they wanted to make certain that any adjustments were legal, that losses were not the result of theft, and that if 100 cattle were bought, the herd really expanded by 100. The scribe would keep records, which would sometimes be compared against a count of possessions. Any losses that couldn't be explained would be a red flag that something wasn't right and needed to be looked into. The notion of recorded into a ledger there must be a debit, developed by Florence merchants and acclaimed by Goethe as "one of the most beautiful discoveries of the human spirit," is usually believed to have been developed during the Italian Renaissance (about 1494 AD, according to one account). "Mr. Pacioli stated that successful merchants had three things in common: access to cash, a regularly updated accounting system, and a competent bookkeeper. Christopher Columbus, who lived at the same time as him, may have been aware of this as he hired a royal accountant to keep tabs on his "swindle sheet" while exploring the New World.

When Goethe referred to double entry accounting as "one of the most magnificent discoveries of the human mind," I believe he exaggerated. Yet as the adage goes, "Beauty resides in the eye of the beholder," and if Goethe was an accountant at heart, I can think of many other discoveries that are more lovely. In any case, it is certain that the discovery of double-entry bookkeeping was crucial because: "Double-Entry Bookkeeping is a method that protects the integrity of the financial values recorded in a financial accounting system. This is

accomplished by creating a double-checking method for every transaction by guaranteeing that each unique transaction is recorded in at least two separate nominal ledgers (sections) of the financial accounting system. To do this, it first classifies values as being either a Credit or a Debit value. A nominal ledger account's credit side (right hand side) will always record the credit value, and the debit side (left hand side) will always record the credit value. A nominal ledger has a Credit (right) side as well as a Debit (left) side. The nominal ledger is said to have a debit balance if the values on the debit side are higher than the values on the credit side. Every transaction must be recorded on the debit side of one nominal ledger and on the credit side of another nominal ledger. This requirement gives rise to the phrase "Double-Entry," which means that each transaction must be entered once on the debit side and once on the credit side. Recall two points. First, one transaction has an impact on two accounts (a double-entry). A debit to an asset account raises the account's worth, while a debit to a liability (or owner's equity) account lowers the account's value. This means that when we pay the bank $1,000, the debit to the loan from bank account lowers the amount we owe, and the credit to cash lowers the balance in our cash account.

Ledgers

It is critical that you comprehend the meaning of this phrase since it may be unfamiliar to you because the version above specifies that debits and credits must be put into a ledger. You'll notice that the terms "journal" and "ledger" are often used to refer to the same thing in the further sources we cite. Simply put, a ledger is a collection of your company's accounts that include transactions that are recorded using the double-entry accounting system. Your ledgers, of which you will have more than one, will be on paper if you are using a fully manual system. These are typically bound volumes that have been specially produced to allow for the entry of transactions. Your ledgers will be on the computer if you use pre-coded application software on a PC for your accounting system.

Various ledger types

The General Ledger and one or more subsidiary ledgers are the two kinds of ledgers used by the majority of businesses. Each account in the chart of accounts has a minimum of one page in the General Ledger. An authoritative source claims: It is also referred to as The Last Book of Entry and G/L. It is a grouping of every balance sheet, revenue, and spending account used to maintain a company's financial records. A general ledger is an ongoing log of account activity and balances. There is only one General Ledger for each business.

Yet, certain accounts, such as accounts receivable or payable, are made up of the total of many separate sums. Let's use accounts receivable as an example. Consider that the General Ledger accounts receivable account has a balance (i.e., total) of USD 3,250. Keep in mind that accounts receivable represent sums that our clients owe us. As a result, the USD 3,250 number in our accounts receivable represents the total of the sums due to us by several different clients. We maintain a subsidiary ledger of each individual account receivable, as shown in Exhibit 39 below, for the benefit of convenience. Each client who has earned the right to be given credit and is expected to pay off their outstanding debt each month gets a page in the Accounts Receivable Subsidiary Ledger. Accounts Receivable balance in the General Ledger of the Company should be equal to the total of the customer balances in the Accounts Receivable Subsidiary Ledger.

When a sale is recorded in the ledger, as in the example of the accounts receivable, a comparable entry is made in the sales journal. Also, a matching record is created in a Cash Receipts Diary whenever a payment is received and posted to a customer's account in the Accounts Receivable ledger. Such subsidiary ledgers are established if there are enough

detail accounts to justify them. For example, detailed accounts may contain product numbers for inventory or personnel accounts for payroll. This type of subsidiary ledger and journal setup protects the General Ledger from excessive detail while preserving the double-entry accounting concept, facilitating reconciliations, and generally fostering accuracy in a company's accounting records. Naturally, things might get more difficult in real life, but this is the general strategy that is used.

The many chances available to small companies to set up and keep records of any kind for their firm using computer software, including accounting, payroll, customer relationship management, inventory control, and similar tasks. The scope of this does not extend much beyond than this.

The most well-known accounting software programmes will probably presume you don't know a lot about accounting. As a result, the majority of products will guide you through the process of setting up an accounting system that is sui for your company and assist you in determining which fundamental reports you need. In addition, most will let you create the sophisticated reports and analysis covered in the next section as well as customised reports catered to your unique requirements. To assist you in making the best decision, there are several resources on the Internet that assess the capabilities, attributes, and costs of accounting software programmes.

In today's fast-paced economic environment, starting a small company may be an exciting, challenging, and costly venture. Just make sure you're selling your things for more than it costs to manufacture them, right? That appears to be all there is to it. Wrong. Without accurate accounting, your growing business might suddenly spiral into insolvency. This is why accounting is essential to the success of any small business. Every financial decision you make, including those regarding raising production, stocking inventories, setting salaries, and buying vehicles, equipment, and supplies, should take it into consideration.

The answer is in today's accounting software, which provides you with the instruments and knowledge required to maintain your financial records while assisting you in maximising the cash flow of your business. Unfortunately, there are as many accounting software programmes as there are different kinds of small businesses, so choosing the one that best suits your company's needs can be challenging. Fortunately, we can help.

You can use the on accounting and in-depth reviews on this website to help you decide which accounting software is best for your company. the analysis so that you won't have to If you have access to the Internet, we strongly advise you to look around our website for suggestions on how to improve your accounting system going ahead.

This is an example from the website where they feature-by-feature compare 10 software programmes. We simply display the names of the packages and their pricing in reprinted below. For further information, you must go to the as you can see, there is a large pricing range (USD 29.99 to USD 1499.00), and the package that costs USD 29.99 is evaluated equally to the one that costs USD 1499.00. This clearly demonstrates the need for research before choosing a certain accounting software product. To help you choose the best accounting software for your company, you may need to enlist the assistance of a professional accountant or, at the at least, a coworker who has studied accounting.

It might be challenging to choose the accounting software that would work best for your company's finances given the variety of options available.

Ease of Use - We search for accounting software that is easy to install, con, and comprehend. You never have to wonder where you are or what to do next since the finest accounting software makes navigation straightforward.

Accounting Modules - To properly manage your company's finances, you need to use accounting modules (such as Accounts Payable and Accounts Receivable). If the fundamentals aren't addressed, all the software's bells and whistles are useless. The financial software expands together with your business. need accounting software that enables you to develop and adapt your system to meet the specific demands of your organisation.

Choose accounting software that provides a variety of report categories. For each module, at least one kind of report should be available for printing. Each part often has reporting capabilities, but it's best if you can generate reports from anyplace in the software. You may save time by creating your own reports; search for accounting software that allows you to do this. You can evaluate what is and isn't working for your firm with the aid of thorough financial reporting.

Look for email and phone assistance, as well as toll-free and live support. Online help is an added plus. We search online for readily searchable, indexed assistance subjects. With your software, you'll need easy access to both technical and accounting support. Accounting software providers have to employ trained individuals (technicians and accountants) to respond to these probing queries.

Predictions for cash flow

Cash is king, as the adage goes in business. Unexpected financial shortages are among the worst things that may occur to a business. This may make it difficult to pay vendors and staff without scrambling to collect necessary funds fast, and when you must do so, you often find it to be a challenging and costly operation. In the worst circumstances, business owners are forced to file for bankruptcy because they are unable to swiftly get financing. Cash flow estimates are created for this reason. They are fast and simple to prepare using a spreadsheet tool. They may also be manually prepared. A cash flow projection helps you ensure that your company will have the cash it needs to satisfy its responsibilities to others by forecasting financial inputs and outputs over a period of time, often at least 90 days. For instance, if the two-month cash flow prediction indicates that you are in a deficit situation, you will have time to obtain the required funds and prevent a sudden liquidity crunch. Depending on the situation, cash flow predictions are often created over longer time frames as well. Also, they often prepare utilising a variety of future predictions (e.g. general economic conditions, sales growth, increased expenses, etc).

According to a reliable website, by understanding your cash position both now and in the future, you can: Make sure you have enough cash to buy enough inventory for seasonal cycles; benefit from discounts and special offers; carefully plan equipment purchases for replacement or expansion; and get ready for enough future financing and identify the kind of financing you need (short term credit line, permanent working capital, or long-term debt). Demonstrate to lenders your capacity to arrange and pay back loans.

The cash flow forecast might be the difference between success and failure for a startup or expanding company. It might be the difference between growth and stagnation for an ongoing firm. Making a cash flow prediction is similar to making a budget and keeping your books balanced at the same time. A cash flow statement simply discusses real cash transactions, in contrast to the income statement. A cash flow statement does not include depreciation since it is a non-monetary transaction. Your cash flow statement will show loan payments (principal and interest), since they entail a cash expenditure.

Sales are the primary source of money. Yet, not all sales in most firms are made in cash. Even if you run a retail firm where the majority of your sales are in cash, it's probable that you provide your customers credit in the form of charge accounts, charge cards, term

payments, layaway, and trade credit. You must thus have a method for determining when those credit sales will result in cash in hand.

Analyses of working capital

Working capital is sometimes referred to as the money a company requires to carry out its regular activities. A working capital analysis and a cash flow prediction are comparable in certain aspects, but a working capital analysis is more focused on the business's operating cycle. The operational cycle examines the days-long accounts payable, inventory, and receivable cycles.

In other words, the average number of days needed to collect an account is used to examine accounts receivable. The typical number of days it takes to sell a product is used to examine inventory (from the point it comes in your door to the point it is converted to cash or an account receivable). The typical time it takes to pay a supplier invoice is used to examine accounts payable. The operational cycle (days of accounts receivable plus days of inventory) cannot often be financed by accounts payable financing alone. As a result, funding for working capital is required. Usually, the net earnings earned internally, externally borrowed cash, or a mix of the two, offset this gap.

Most companies will eventually need loans for short-term operating capital. To build up seasonal inventory between September and November in preparation for Christmas sales, for instance, businesses need to secure working cash. Nonetheless, even a firm that is not seasonal sometimes encounters peak months when sales are surprisingly high. As a consequence, working capital is required to finance the accumulation of inventories and accounts receivable. 2009 Entrepreneur.com A working capital analysis is prepared similarly to how we described for a cash flow forecast in that assumptions are made about how activities during the forecast period will affect working capital in order to give the business owner confidence that enough working capital to support operations will be produced by typical business operations. If not, alternative working capital sources must be set up, and the sooner a need for such sources is identified, the better.

Breakeven evaluation

You may use a break even analysis to determine how much income is needed to pay your fixed and variable expenses. Revenue below the breakeven threshold indicates a loss-making operation, whereas revenue over the breakeven point indicates a successful operation.

Let's examine a simple scenario in which it is assumed that your company sells only one product. You need to be aware of three factors in order to determine the breakeven point: Your unit selling price, variable costs, and fixed expenses

Your company will become profi after the breakeven threshold has been reached and sales keeps increasing. This is why it's crucial to understand your unit sales breakeven threshold. The website in has a simple method for figuring out your breakeven point: Take your fixed expenses and divide them by your pricing minus your variable costs to get your breakeven analysis. This is expressed as an equation: Breakeven Point = Fixed Costs/ (Unit Selling Price - Variable Costs)

You may use this method to determine how many units of a product you must sell in order to break even. When you reach that stage, you will have fully recouped the cost of generating your goods (both variable and fixed). Every extra unit sold over the breakeven point boosts earnings by the unit contribution margin, which is the amount each unit contributes to reducing fixed costs and boosting profits. Unit Contribution Margin is denoted by the equation: Sales Price - Variable Costs.

By keeping track of this data in a spreadsheet, you can simply make modifications as expenses vary over time, experiment with various pricing points, and quickly determine the resultant breakeven point. If you were to set a profit target for yourself, say USD $1 million, you could do so using a tool like Excel's Goal Seek, and then work backwards to determine how many units you would need to sell to reach that target. (You may learn how to utilize Goal Seek from this online lesson)".

Cost-benefit analyses (e.g., by customer, product, region)

Managers produce a variety of studies to get a more in-depth understanding of how their companies are run. Profitability analyses are one of the most crucial ones. Intuitively, managers are aware that certain clients are more lucrative than others, that some goods have higher gross margins than others, and, if the company offers services outside the local area, that some geographical areas are more profi than others. Although having a general understanding of these concepts is beneficial, having concrete knowledge is preferable. And to be certain about them, it is necessary to perform comprehensive analyses.

QUESTIONNAIRE

1. How many types of financial statement in finance accounting?
2. How are differentiate between accrual method versus cash method?
3. How are differentiate between financial accounting versus managerial accounting?
4. What are factor to need in users of financial statement?
5. What are types of objective of financial statement?
6. What are characteristics of financial statement?
7. How many constraints of relevant and reliable information?
8. What are different types of element of financial statement?
9. What are component of Recognition of the Elements of Financial Statements?
10. How can measure the Reliability of Measurement?
11. What are factor of Measurement of the Elements of Financial Statements?
12. How can determine the determination of profit?