



HISTORY OF THE DEVELOPMENT OF THE CONSTRUCTION INDUSTRY AND THE EFFECT OF INNOVATION MANAGEMENT IN THE USE OF RAW MATERIALS

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Abstract. Construction is one of the oldest and largest industries in the world, with a market size of nearly ten trillion US dollars. Construction has traditionally been a contracting business since ancient times, and the industry includes a large number of small firms. Currently, the construction industry is one of the largest sectors in any economy. It makes a significant contribution to the national economy and provides employment to many people. This article looks at what we mean by the construction industry and how it is defined by professionals and regulatory bodies.

Key words: construction industry, innovative management, innovation, building materials, management, building structures, inventory, construction waste.

Construction is a general term that refers to the art and science of building objects, systems or organizations. Construction is an industry that includes the construction, maintenance and repair of buildings and other fixed structures, the construction of roads and service facilities that are an integral part of the structures and necessary for their use. In its most general context, construction encompasses the processes involved in the end-of-life delivery of buildings, infrastructure and industrial facilities and related activities. Construction includes structural additions and alterations, but excludes the construction of mobile structures such as trailers and ships. It usually begins with planning, financing, design, execution, construction, and also covers maintenance, maintenance, and improvements.

Since mankind has been building structures for centuries, construction is also a historical process. The first huts and shelters were built by hand or with simple tools. Most of the oldest buildings did not survive into this century because they were built of non-permanent materials. As cities grew during the Bronze Age, a class of professional craftsmen such as bricklayers and carpenters emerged. From the dream of the architect and the aspiration of the engineer to the ultimate satisfaction of the user, construction represents many of the noble achievements of our civilization. The formal construction industry itself formally began 3,000 years ago, when the Egyptians began organizing and building large structures of stone and baked brick. The 3,000-year-old Egyptian pyramids were assembled from mammoth blocks of stone; Guatemala's 2,500-year-old Mayan temples are hand-hewn stone.

Some structures built of stone and brick have been preserved, and the builders of history have left many wonders for us. Among the classics of the past, we can mention the pyramids of Egypt, Taj Mahal and the Great Wall of China.

In 1796, a major breakthrough in building design began the use of cast iron columns in the industry, allowing architects and builders to construct buildings over 10 stories tall. By

the 19th century, 14- and 15-story buildings were built, and modern skyscrapers with more than 100 floors were equipped with mechanical elevators.

Today, construction has become a leading industry in all market economies around the world. The construction industry accounts for more than 10% of global GDP (6-9% in developed countries) and employs approximately 7% of the global workforce (approximately 273 million people). In 2022, the output of the world construction industry was approximately 15.8 trillion dollars.

It is believed to be the first indicator of the health of the economy. Its acceleration initiates rapid economic growth and vice versa. Korea, Taiwan and Hong Kong have used the construction sector to propel themselves into vibrant economies. Malaysia and China are using the same strategy by rebuilding their cities and highways etc. to become major players in the global economy.

Each type of construction project requires a unique team to plan, design, build and maintain the project. In general, there are three types of construction:

- Building construction, which is the process of adding a structure to real estate.
- Industrial construction processes require highly specialized expertise in planning, cost estimating, design and construction.
- Infrastructure construction, also called heavy construction or heavy engineering, includes large public works, dams, bridges, highways, railroads, water or wastewater, and utility distribution.

Large-scale construction is usually managed by a project manager and supervised by a construction manager, design engineer, structural engineer, or project architect.

Materials management is a complex and critical part of every construction project. While many associate it primarily with the procurement and delivery phase, materials management actually covers a much wider range of activities; from planning and procurement to waste management and disposal.

A well-executed materials management strategy can deliver significant cost savings and improve project efficiency. Done poorly, it can lead to major delays, security issues, and reduced profitability. Learn about the role of building materials management and the key part it plays in the success and profitability of construction projects of all sizes.

What is Construction Materials Management?

Construction materials management is the process of procuring the right materials at the right cost and ensuring they are available - at the right place and to meet project requirements and deadlines. This is a critical task for construction projects of any size. The quality of building materials management can make or break a project budget. A poor materials management strategy leads to cost overruns through reduced labor productivity, material waste, and missed project milestones and deadlines. However, the dialed strategy has some important advantages, which we will discuss in more detail. Digitize your workflows and manage material costs with Tread construction fleet management software. Request a free demo now.

What are the types of building materials management?

Construction materials management includes a wide range of activities throughout the life of a project, including:

- Planning and procurement of materials
- Planning and transportation



- Acceptance and quality control
- Storage and inventory management
- Transportation on site
- Waste management

What are the benefits of building materials management?

Considering the impact on workflows and profitability, investing in improving your materials management system can have a significant positive impact on your overall construction management efforts. Some of the many benefits of building materials management include:

Maximizing worker productivity. Labor costs are a common target of cost reduction measures in the construction industry. The most common way to achieve these cost savings is usually to reduce working hours and wages as much as possible. However, worker productivity is often overlooked as a way to reduce costs. Effective materials management can play a key role in increasing productivity.

A construction crew must have the right materials at the right time to achieve their goals. The more time spent waiting for the delivery of equipment and materials or tracking them down at the construction site, the more likely they are to fail and delay the project or incur overtime.

Reduce or eliminate re-handling of materials. Another source of reduced labor productivity and associated costs is material handling, which often accounts for 40 percent of a team's time on the job site. A good materials management system includes proper communication, planning and tracking tools. With them, sites are prepared for materials, and they can be laid and stored in the most ideal place. This level of control ensures that workers do not waste time moving materials and equipment when needed. Ideally, deliveries of materials should be scheduled so that appropriate personnel are available to receive and inspect them. Project materials should be dropped off at an existing storage location or as close as possible to where they will be used. This avoids unnecessary re-handling, which saves time and reduces the risk of damage during transport. After all, the more time spent moving materials, the better.

Reduce the chance of theft or weather damage. The sooner it can be used in delivery to the construction site, the better. This is especially true when there is minimal (or non-existent) secure, weatherproof storage space. Proper planning, along with getting the right amount of building materials, will reduce the amount of time spent sitting on the job site unused. This reduces their exposure to the elements and possible weather damage, and also prevents them from becoming a target for theft.

Reduction of material waste. Effective materials management systems not only ensure that materials are in the right place at the right time, but also ensure that the right type and quantity are procured in the first place.

Buying the wrong building materials can cause a number of problems, from minor delays to safety hazards. Incorrect materials may result in contract penalties if they do not meet project requirements/code or miss deadlines.

Similarly, the lack of necessary materials leads to additional costs and delays construction while searching or waiting for more time. Ordering smaller quantities of additional materials generally has a higher cost per unit than bulk materials, which further increases overall costs. It can also lead workers to substitute materials that may be inadequate, which can again lead to safety issues or contract penalties for not meeting project requirements.

On the other hand, overproduction leads to material waste. This is costly for construction projects because of the waste of money on unnecessary materials and associated storage and disposal costs. Material waste can also result from poor storage conditions or storage deterioration due to delivery too early and expiration before use.

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