



# THE FUTURE IS NOW: LEVERAGING BUILDING INFORMATION MODELING (BIM) FOR MARKETING SUCCESS

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## Abstract:

Architecture, Engineering and Construction (AEC) industry is rapidly evolving. Building Information Modeling (BIM) represents a digital transformation of AEC industry and is improving project execution by enhancing efficiency, transparency, quality and cost effectiveness. This paper investigates applications of marketing of BIM, addressing the necessity for change in industry mindset in response to digital revolution. Driven by desire to maximize the potential of BIM experts and companies, this article identifies the key challenges they may face from a marketing perspective. The aim is to bridge a gap between engineering and marketing needs. Article includes data from global investment trends of construction industry, BIM adoption rates and evolution of marketing within the industry, revealing a significant lag in digital marketing compared to other sectors. Findings show that while BIM unlocks substantial operation advantages, it is not up to its full potential due to inadequate marketing strategies. This paper offers a new modern approach to marketing in AEC industry, emphasizing education, investment in innovation, and smart usage of social medias, to align with digital nature of BIM. Insights not only contribute to theoretical marketing, but also are crucial to pioneers aiming to leverage BIM for competitive advantage.

## Keywords:

Building Information Modeling, AEC Industry, Digital Marketing, Strategy Adaptation, Technological Integration.

## INTRODUCTION

Over the last few decades, advancements in digitization and technology in the AEC (Architecture, Engineering, and Construction) industry have led to significant changes in the way construction projects are designed and executed. The 1990s were marked by 2D drawing within AutoCAD. Now, the key innovation transforming this industry is highlighted as "Building Information Modeling" (BIM). BIM represents a new digital technology that enables work within a 3D model, providing benefits such as improved coordination, transparency, quality, while reducing costs and production time.

The AEC industry, which is traditionally of a conservative business nature, has a small number of companies paying little attention to marketing.

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With the rise of specialized consulting services within the BIM method, it is necessary to adapt existing or establish new marketing strategies.

Thanks to the use of the internet and easy access to a large amount of data in the last two decades, rapid development of digital marketing has been enabled. Business-social networks within digital marketing play an important role in creating a marketing strategy. The goal of this paper is to explore the marketing possibilities of the BIM method and the challenges it brings.

## 2. APPLICATION OF MARKETING IN THE CONSTRUCTION INDUSTRY

### 2.1. STATE OF THE CONSTRUCTION INDUSTRY

Globally, the construction industry accounts for about 8-10% of the total economy of countries [1] [2] and acts as a link between other industries and the economy. Despite its significant share, the construction sector is one of the least digitized sectors. The adoption of new digital technologies such as Building Information Modeling (BIM) represents a major shift in the industry.

The world's three largest investors in the construction sector are China, the United States, and India, each investing hundreds of billions of dollars annually. They are followed by countries like Japan, Saudi Arabia, the United Arab Emirates, Germany, Brazil, Russia, South Korea, and Turkey, which invest tens of billions of dollars annually. The construction sector of the European Union employs 18 million people and accounts for 9% of the union's total GDP, or 1.3 trillion euros [3] [4].

From the data provided, it is concluded that investments in the construction sector are constantly increasing on a global level, and that the construction industry plays a large role in the development of a country.

### 2.2. INNOVATIONS IN THE CONSTRUCTION INDUSTRY

Industrial revolutions have played major roles in shaping humanity. Currently, we are in the phase of the fourth industrial revolution, the so-called "digital revolution," where, thanks to the internet, people are interconnected and have easy access to a large amount of information [2].

These significant changes in industrialization have also affected the construction industry. The initial application of steam engines and the development of infrastructure in the form of railways and steam locomotives

enabled more efficient material transport and increased production volume. Electric power allowed the use of a more diverse set of new machines and tools, resulting in new construction methods. The development of electronics has provided engineers with a series of new advantages such as GPS systems or new software. The most widespread software is certainly AutoCad, which is used for 2D design, with limited 3D design capabilities that mainly relate to the global coordinate system.

With the advent of the digital revolution, the construction industry has been slow to adapt compared to other industries and is one of the least digitized despite being one of the most important industries. It is currently facing a major change that has come with digitization, namely the BIM method. This significant and sudden change and digitization pose numerous challenges for both engineers and marketers.

Companies in the construction industry have to adapt to current changes and to operate in a more extrovert and market-driven way [5] in order to be classified as a modern industrial enterprise [6].

### 2.3. DEVELOPMENT AND APPLICATION OF MARKETING IN THE CONSTRUCTION INDUSTRY

Due to changes in professional services in the 1960s, consultants were forced to adapt [7], leading to the advancement of marketing of professional services [8]. It was only between 1979 and 1984 that marketing within professional services in the construction industry began to play an increasingly important role [9].

In the early 2000s, construction companies began with digital marketing, using websites. Over time, websites became more interesting and informative. With the development of business-social networks like LinkedIn, Xing, and Twitter in the mid-2000s, companies began to connect better with clients. The beginning of the 2010s marks the start of using SEO (Search Engine Optimization) to improve ranking on Google. By the mid-2010s, companies started using apps like Instagram to visually provide insights into their services.

Today, construction companies are beginning to use more digital marketing opportunities. Social media plays an important role in communication with customers and improve marketing performance and is enabling companies how need of customers is evolving [10] [11] [12]. With the development of BIM, companies have gained additional digital marketing capabilities. The BIM model essentially represents an identical twin of the future real object. 3D modeling and visualization



have enabled companies to efficiently present the digital model of the object to clients using VR technology [13], so that clients have a clear insight into what they can expect as a finished product. Clients can be presented with a 3D virtual model, through which they can move, choose the time of day or year, locations on the planet, select wall colours, choose traffic density, check the building's energy efficiency, or any other element.

#### 2.4. APPLICATION OF DIGITAL TECHNOLOGIES IN AEC INDUSTRY

BIM, as a digital technology, has multiple applications in the construction industry. Its numerous advantages lead to the increasing use of this method worldwide, while in the most developed countries, it has become mandatory for state projects and projects of great significance. In our region, Slovenia is leading with the implementation, introducing BIM as a mandatory design method from January 1, 2024. The Republic of Serbia plans to do the same in 2028.

Applications of the BIM method include 3D design, 3D visualization and simulation, virtual reality, time simulation, reduction of errors and risks, reduction of construction waste, automation of quantity take-offs and cost estimates, more efficient planning and coordination, management and maintenance of the facility, ecological sustainability, use of drones and robotics for 3D scanning and analysis of large amounts of data.

All in all, thanks to BIM, better project management is enabled, costs are reduced while efficiency and project quality are simultaneously increased. In this way, BIM plays a key role in the digital transformation of the AEC industry.

### 3. DIGITAL TECHNOLOGY MODEL OF THE CONSTRUCTION INDUSTRY

#### 3.1. BUILDING INFORMATION MODELING

Building Information Modeling (BIM) represents the digital transformation of planning, construction, and utilization of structures within a single 3D model (Figure 1) and finds its broad application in the AEC (Architecture, Engineering, and Construction) field. 3D models are digital twins of real objects that contain all necessary information.

According to the National BIM Standard (NBIMS, USA), BIM is a construction method that involves creating and managing digital representations of the physical and functional characteristics of places. Construction models serve as an information database about the structure to offer a reliable decision-making source throughout the entire lifecycle – from the initial conceptual planning to deconstruction.

3D modelling is just one part of complex BIM method that consists of the following elements Figure 1:

- Use of drones and robotics for 3D scanning;
- Analysis of large amounts of data;
- 3D modelling (3D design);
- 4D modelling (Time factor);
- 5D modelling (Quantity take-off and cost estimation);
- 6D modelling (Facility management); and
- 7D modelling (Lifecycle of objects).

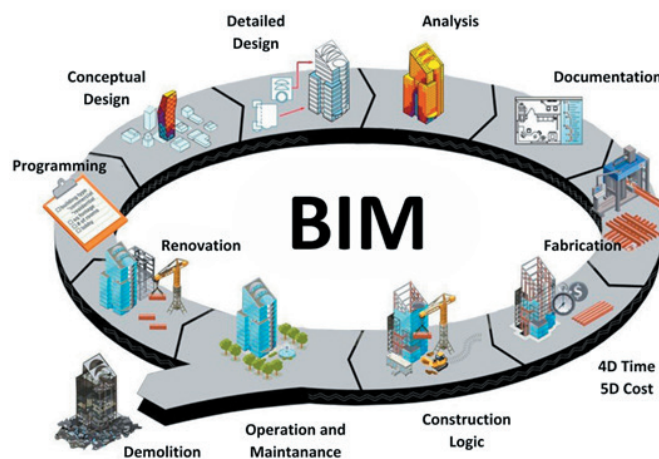


Figure 1. BIM Life cycle of the construction.



Figure 1 shows the process of the BIM method. A BIM project begins with the signing of a BIM contract, which includes, among other things, the BIM project task defined by the investor. Based on this document, design companies create a BIM execution plan. This document contains all information related to the project: general information, project goals and objectives, the scope and detail of BIM development, roles, standards, data exchange method, modeling and documentation method, delivery deadlines, software definition, quality control and clash detection, nomenclature, and all other relevant project-related data.

The two most important roles in a BIM project are: the BIM manager and the BIM general coordinator. The BIM manager represents the investor, while the BIM general coordinator represents the designer.

BIM has quickly gained great popularity due to its advantages that positively affect all project phases. A project is considered successful if it is completed within the planned timeframe, within the appropriate budget, and with the appropriate quality. This method improves all these three aspects, so all project participants benefit: the investor, designer, contractor, and supervisor. Not to forget the users who also indirectly receive a better end product.

With its advantages, this method transforms the construction industry and represents the most important element in construction within the fourth industrial revolution. BIM changes business methods and the entire workflow.

### 3.2. BUILDING INFORMATION MODELING

The idea of 3D modeling originated in the United States (US) back in the 1970s. However, concrete steps towards implementation followed decades later. This delay was mostly caused by technology development. During the 2000s, the first applications of BIM occurred in the US with the initiative and support of the government. A little later, 2010 United Kingdom was the first country in European continent to engage BIM.

In the United Kingdom, the use of BIM in 2011 was about 12%, and this number has been constantly increasing to approximately 70% by 2020. China issued an official announcement in 2015 stating its plan to have 90% implementation of the BIM method by 2020. However, it turned out that the implementation rate in 2020 reached below 20% [14].

Good BIM implementation example is Germany, although late BIM adopter (2015), is one of only of 4 countries in world along with United States, United Kingdom, Germany and Singapore with more than 50% of BIM implementation in public projects. German construction sector is following UK BIM Implementation strategy.

### 3.3. BUILDING INFORMATION MODELING ADVANTAGES

BIM allows all project team members to view and collaborate on the same model, ensuring that everyone is working from the same data set. The benefits of BIM include increased accuracy, improved communication, and reduced costs. In addition, BIM can help to optimize building performance and sustainability.

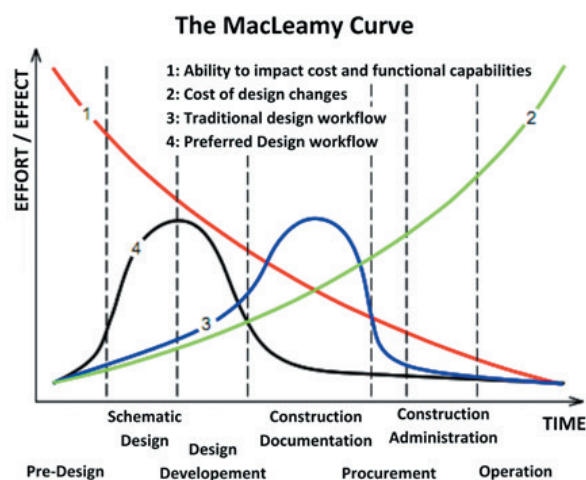


Figure 2. MacLeamy BIM Curve.



One of the greatest advantages of the BIM method is the ability to make design decisions in the earlier phases of a project than is the case with the conventional 2D method, as shown on Figure 2. Compared to the conventional method, the BIM method more closely aligns with the desired flow of design dynamics, as shown by the blue function on the MacLeamy curve. In conventional design, errors can cause significant costs, both in time and money, as these costs exponentially increase as we approach the end of the project, while the effect that a change or new solution can bring benefits or solve a problem.

## 4. MARKETING OF BIM IN AEC INDUSTRY

### 4.1. MARKETING IN AEC INDUSTRY

Service marketing is a part of marketing, and its development has been somewhat slower compared to the marketing of goods. Until 1970, this field was not even considered an academic area [15]. The first international conference on the topic of service marketing was held in the USA only in 1982. At that time, the differences that exist between services and goods were not understood. Today, service marketing is better researched, and the most important differences compared to goods marketing are the four fundamental characteristics of service marketing: intangibility, inseparability, heterogeneity, and perishability.

As we see, service marketing developed later compared to the marketing of goods. Service marketing within the AEC (Architecture, Engineering, and Construction) industry developed slower compared to other services. The reasons for this lie in the conservative business practices of construction companies and the mindset of engineers who do not fully understand marketing. Another reason lies in the fact that companies obtain contracts through public tenders, where the choice of the best bidder is often predefined by references from previous projects and price. For these reasons, companies have long not given marketing great importance.

At the beginning of the 1990s, a very small number of construction companies had a marketing department [16]. By the mid-1990s, a better understanding of the possibilities of marketing in AEC sector companies began, and since then, there has been a trend of growth in the creation and use of marketing strategies in this area.

From the late 1990s to 2010, much research on marketing strategies playing a significant role in the AEC sector was conducted [7]. One of them is based on the following elements: company location, professional relationship with the client, business promotion, professional contracts, marketing mix, and research.

Further marketing development can be seen in the 7-step marketing strategy [17], that is based on the following elements:

1. Selection of clients with whom the company wants to work;
2. Identification of the needs of targeted clients;
3. Designing services to match the needs of targeted clients;
4. Communicating availability and capacity to targeted clients;
5. Proposals, tenders, and presentations;
6. Adding additional value and ensuring service repetition; and
7. Building credibility.

### 4.2. BIM MARKETING

The transformation of AEC industry through BIM, has led to the need to adapt special marketing strategies that adequately promote the BIM method of the company. This introduces significant opportunities and challenges for marketing experts within conservative construction Industry.

Given that BIM is a new method that is rapidly evolving signifies a paradigm shift not only how we design projects but also how are companies in AEC sector position themselves and engage with target audience.

#### 4.2.1. Challenges in BIM Marketing

**Digitalization and Innovation Resistance:** good part of AEC sector is conservative towards digitalization. This leads to slow adoption of contemporary marketing strategies. Many companies are missing out the opportunity to effectively use BIM and AI to better understand the customer needs and market trends.

**One-size-fits-all Approach:** Many large corporations in AEC are relying on the same marketing strategies for many different communication platforms such as LinkedIn, Instagram, and company websites. Here they are missing the opportunity to show themselves in different ways and to target different segments of target audience [18].



**Top management's Limited Marketing Understanding:** In most sectors, AEC sector also, marketing of a company depends mostly on the marketing understanding of CEO. According to Philip Kotler [19] in example of Ikea CEO, Ingvar Kamprad is one of the most influential marketing experts in history. In this example we can see how business can flourish when CEO understands marketing. Top-down approach, where CEO has minimal marketing knowledge, can neglect marketing aspects that are essential for building strong, brand-awareness and customer loyalty.

**Startups Resource Constraints:** startups are more open to experiment with digital marketing. However, their limited resources and lack of marketing experts can lead to poor results in poor. This often leads to low engagement rates or not understanding problems they are facing.

**Outdated Marketing Principles:** Companies in AEC sector often hire low cost, but established marketing agencies, to cut costs. This amplify the challenge and those agencies are struggling to demonstrate how actually modern marketing approaches can tenfold benefits that are expected from marketing such as driving innovation, enhancing brand visibility, and build up customer loyalty.

#### 4.2.2. Solution in BIM Marketing

**Educating Leadership:** Shift in mindset of leaders can be inspired through highlighting the successes of AEC industry leaders who value marketing and are demonstrating success.

**Application of artificial intelligence (AI):** Digital nature of BIM unlocks the potential of advanced technologies such as AI, which can play huge role in understanding of needs of targeted audience and can have significant potential in enhancing marketing [20].

**Embracing Digitalization:** If the AEC sector fully embrace digitalization, not just in design, but also in marketing, it will be able to predict market trends using AI and create such marketing strategies that will lead businesses to evolve.

**Platform-Specific Strategies:** Marketers need to respect the different communication platforms and its native format to gain good reach and engagement rates. Understanding those differences will allow more effective and targeted marketing efforts.

**Investment in Talent and Training:** Investing in marketing strategy does not always have to be expensive.

Existing staff can be trained. Also hiring talented young marketer can bridge the gap. Continuous learning is essential for staying updated.

**Strategic Resource Allocation:** For companies with limited financial resources, it is recommended hiring extern marketing experts, that are proven. They will be able to create low-cost, but high-impact marketing strategy that will yield significant returns.

## 5. CONCLUSION

Building Information Modeling (BIM) is a immense shift in AEC Industry. This creates necessity for profound marketing strategies transformation. This paper explores how BIM dictates innovative approach in marketing that aligns with its digital nature.

The AEC sector is at crossroads where BIM capabilities can significantly enhance project delivery and satisfaction. Historically construction industry has proven to be conservative and slow with marketing adoption. The AEC marketing journey consists of many challenges, such as resistance to change and digital, one-size-fits-all approach to marketing, limited marketing understanding of top management, limited financial resources in startups, and outdated marketing principles. Those are proof of necessity for the AEC sector to evolve towards more dynamic, tailored and forward-thinking marketing strategies that can leverage BIM's and companies' full potential. Communication tools, such as social media are going to play significant role, as they are already playing huge roles in lives of people. In 2022 over 4,59 billion people are using social media, with projection to 6 billion in 2027 [21].

To navigate these challenges, solutions such as educating leadership on the value of marketing, embracing digitalization beyond design processes, adopting platform-specific marketing strategies, investing in talent and training, and strategic resource allocation are of greatest importance. By doing so, companies can better position themselves in market. They will be able to foster innovation, enhancing brand visibility, and building stronger customer relationships.

The digital transformation introduced by BIM extends beyond technology and design and into the realm of strategic marketing. This article has demonstrated, how successful marketing of BIM services in the AEC industry requires a shift in mindset. Being open to innovation and a commitment to continuous learning and adaptation is needed.



By doing so, the industry and companies can fully harness the advantages of BIM, paving the way for more efficient, sustainable, and client-centered construction projects.

In essence, the future of construction lies not just in the adoption of advanced digital tools like BIM but in reshaping how these tools are marketed and leveraged to drive business success.

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