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| RESEARCH ARTICLE

Constructing the Future: Unveiling Novel Approaches to Entrepreneurship Development in Construction and Contracting Industries

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| ABSTRACT

In the building and contracting industries, entrepreneurship development has been studied in this research using innovative and novel ways. Entrepreneurs in the construction and contracting industries need to adjust to these changes in order to stay competitive, given the rising demand for sustainable development and technology improvements. This study identifies a number of creative tactics that entrepreneurs can use to develop their abilities and advance their firms through a thorough review of the literature and case studies. These tactics consist of implementing cutting-edge technology, implementing sustainable habits, forming strategic alliances, and creating efficient financial and marketing plans. Additionally, the article explores the difficulties business owners in the contracting and building sectors confront and suggests ways to overcome them. The study's findings add to the body of knowledge on entrepreneurship in the construction and contracting industries and offer actionable advice for entrepreneurs looking to grow their companies.

| KEYWORDS

Entrepreneurship development; Construction industry; Innovative strategies; Sustainable practices; Strategic partnerships

| ARTICLE INFORMATION

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1. Introduction

With nearly 110 million workers and 6% of the global GDP, the construction and contracting industries are essential to the growth of the world economy (OECD, 2021). Entrepreneurs must innovate to stay competitive as these industries develop and adjust to new technologies and market demands. In order to improve company practises and achieve success, this research paper examines creative approaches to entrepreneurship development in the contracting and building industries. These tactics include utilising cutting-edge tools like 3D printing and building information modelling (BIM), implementing sustainable habits to cut waste and increase efficiency, forming strategic alliances with vendors and other stakeholders, and creating efficient marketing and financial plans.

The growth and viability of firms in the construction and contracting industries depend on the development of entrepreneurship. Due to the intense competition and dynamic nature of these industries, business owners must employ creative strategies to stay ahead of the pack. New methods for entrepreneurship growth have surfaced in recent years, and they have the potential to revolutionise the way building and contracting companies work. The use of digital technologies like Building Information Modelling (BIM), 3D printing, and drones is one of the most promising strategies for entrepreneurial development in the building and contracting industries. Construction projects have been demonstrated to benefit from improved collaboration, decreased errors, and increased

efficiency when using BIM in particular (Azhar, Carlton, & Olsen, 2011). Similar to how faster and more affordable building procedures could revolutionise contracting and construction, 3D printing and drones are poised to do so (Pessoa S. et al., 2021; Lee, Kim, & Park, 2018). Lean construction concepts are another strategy for encouraging entrepreneurship in these sectors. According to Koskela and Howell (2002), the goal of the lean construction methodology is to minimise waste and increase value in construction projects. Entrepreneurs in the building and contracting industries can boost productivity, save costs, and boost customer satisfaction by implementing lean principles. And last, the contracting and construction industries are becoming more and more interested in social entrepreneurship. According to Mair and Marti (2006), social entrepreneurship is the pursuit of social, environmental, and economic objectives through entrepreneurial endeavours.

2. Literature Review

Table 1
Entrepreneurship definitions

Definition	Publication
Entrepreneurship in construction refers to the creation and management of construction businesses that are innovative, adaptable, and capable of exploiting new opportunities in the market.	Odeyinka, H. A., & Yusif, A. R. (2018). Entrepreneurship in construction: a review of definitions, theories and empirical evidence. Construction Economics and Building, 18(1), 1-14.
Construction entrepreneurship involves taking calculated risks to start and operate a construction business, creating value for customers, and generating profits for the business owners.	Bocken, N. M., Short, S. W., Rana, P., & Evans, S. (2014). A literature and practice review to develop sustainable business model archetypes. Journal of Cleaner Production, 65, 42-56.
Entrepreneurial construction is the process of creating and managing a construction business that is driven by innovation, creativity, and risk-taking to deliver exceptional results to clients.	Othman, M. F., & Abdul-Aziz, A. R. (2016). An overview of entrepreneurial construction: concept, theory and application. International Journal of Construction Management, 16(2), 139-153.
Construction entrepreneurship involves identifying and exploiting market opportunities in the construction industry through innovative products and services, process improvements, and strategic alliances.	Leiringer, R., & Sandberg, M. (2016). Entrepreneurial opportunities in infrastructure projects: a conceptual framework. Construction Management and Economics, 34(9), 645-657.
Entrepreneurial construction involves developing and implementing innovative business models that enable construction firms to operate in a competitive and sustainable manner while creating value for stakeholders.	Teixeira, R. F., & Cardoso, R. A. (2019). Business model innovation in construction: a systematic review. Journal of Cleaner Production, 238, 117930.
Entrepreneurial construction involves the creation and deployment of innovative technologies, processes, and business models to deliver construction projects that meet the evolving needs of clients and society.	Choi, J. W., & Kim, Y. W. (2017). Smart construction: a review of current status, opportunities, and barriers. Journal of Cleaner Production, 156, 826-839.
Construction entrepreneurship involves the identification and exploitation of new business opportunities in the construction industry through the use of technology, market analysis, and strategic partnerships.	Li, Z., Li, J., & Skibniewski, M. J. (2019). Construction entrepreneurship in the era of big data: a conceptual framework. Journal of Cleaner Production, 239, 118074.
Entrepreneurial construction is the process of	Leiringer, R., & Sandberg, M. (2016).

identifying and pursuing new business opportunities in the construction industry through innovation, creativity, and strategic thinking.	Entrepreneurial opportunities in infrastructure projects: a conceptual framework. Construction Management and Economics, 34(9), 645-657.
Construction entrepreneurship involves the creation and management of construction businesses that are sustainable, socially responsible, and environmentally friendly while also generating economic value for their owners.	Rameezdeen, R., & Zuo, J. (2014). Sustainable entrepreneurship in the construction

3. Current state of the construction and contracting industries

The emphasis on sustainable development and the incorporation of cutting-edge technologies that characterises the contemporary status of the construction and contracting industries.

3.1 Ongoing Demand for Sustainable Development:

The understanding of the urgent need to solve environmental, social, and economic concerns to secure a sustainable future for the world and its inhabitants is what drives ongoing demand for sustainable development. In order to satisfy current requirements, sustainable development must not jeopardise the ability of future generations to satisfy their own needs. An exhaustive summary of the continuous need for sustainable development is provided below:

- *Environmental Concerns:* One of the primary drivers of the demand for sustainable development is the growing awareness of environmental issues such as climate change, deforestation, loss of biodiversity, pollution, and resource depletion. These concerns have led to a shift towards sustainable practices to reduce negative impacts on the environment and preserve natural resources for future generations.

- *Climate Change Mitigation and Adaptation:* The threat of climate change and its wide-ranging impacts, including rising global temperatures, extreme weather events, and sea-level rise, has increased the demand for sustainable development. Governments, businesses, and communities are actively seeking solutions to reduce greenhouse gas emissions, transition to renewable energy sources, and develop climate-resilient infrastructure.

- *Social Equity and Inclusion:* Sustainable development emphasizes the importance of social equity and inclusion by addressing poverty, inequality, and social injustice. There is a growing demand for sustainable practices that ensure fair distribution of resources, promote social cohesion, provide equal access to education and healthcare, and empower marginalized communities.

- *Corporate Social Responsibility (CSR):* The business sector plays a crucial role in driving sustainable development through CSR initiatives. Consumers are increasingly demanding that companies take responsibility for their environmental and social impacts. This has led businesses to adopt sustainable practices, reduce their carbon footprint, promote ethical sourcing and manufacturing, and contribute to community development.

- *Sustainable Urbanization:* Rapid urbanization has put pressure on resources and infrastructure, leading to increased demand for sustainable urban development. Cities are seeking solutions to promote efficient transportation, enhance energy and water management, create green spaces, and improve air quality. Sustainable urban planning aims to create liveable cities that are environmentally friendly and socially inclusive.

- *Circular Economy:* The concept of a circular economy, which aims to minimize waste and maximize resource efficiency, has gained traction in the ongoing demand for sustainable development. The shift from a linear "take-make-dispose" model to a circular system that promotes recycling, reusing, and reducing waste is seen as a way to decouple economic growth from resource consumption and environmental degradation.

- *Sustainable Agriculture and Food Security:* The need for sustainable agricultural practices is driven by the challenges of feeding a growing global population while minimizing the environmental impact. Demand for organic farming, agroecology, and responsible land management practices is increasing to ensure food security, protect ecosystems, conserve water, and promote biodiversity.

- *Renewable Energy Transition:* The transition from fossil fuels to renewable energy sources is a critical aspect of sustainable development. The demand for renewable energy technologies such as solar, wind, hydropower, and geothermal is rising as countries and businesses seek to reduce dependence on fossil fuels, decrease greenhouse gas emissions, and promote energy security.

- *Sustainable Consumption and Production:* There is a growing recognition that unsustainable patterns of consumption and production are major contributors to environmental degradation. The demand for sustainable consumption involves making responsible choices as individuals and communities, considering the environmental and social impact of products and services. Similarly, sustainable production aims to minimize waste, pollution, and resource depletion throughout the production process.

- *Global Policy Frameworks:* The ongoing demand for sustainable development is supported by international policy frameworks such as the United Nations Sustainable Development Goals (SDGs). Governments, organizations, and individuals are aligning their efforts with these goals, which provide a roadmap for achieving a sustainable and inclusive future.

3.2 Rapid Advancements in Technology:

Low productivity levels and labour-intensive processes have long been hallmarks of the construction sector. However, the industry has been severely impacted by technological improvements, which have increased productivity, security, and overall competitiveness. Here is a broad overview:

- *Building Information Modeling (BIM):* BIM is a digital representation of a building's structural and operational details. Construction project cooperation, coordination, and visualisation are made possible, which improves stakeholder planning, design, and communication.
- *Prefabrication and Modular Construction:* Off-site construction techniques like prefabrication and modular construction have been made easier by technology. These methods entail putting together building parts in controlled settings away from the construction site, hastening construction while reducing waste and improving quality.
- *Robotics and Automation:* In the construction business, automation and robotics utilisation has grown, especially for labour-intensive, repetitive jobs. Bricklaying, pouring concrete, and material handling are all jobs that can be carried out by automated equipment and robotic systems, increasing productivity and safety.
- *Drones and Remote Sensing:* Construction industry personnel can collect data, track progress, and conduct surveys more accurately and efficiently thanks to drones that are fitted with cameras and sensors. LiDAR and satellite imaging are two examples of remote sensing technologies that offer useful information for site study, mapping, and monitoring.
- *Augmented Reality (AR) and Virtual Reality (VR):* Immersive visualisation, simulations, and virtual tours of construction sites are made possible by AR and VR technologies. Better design comprehension, clash identification, and stakeholder participation are made possible by these technologies, which improves decision-making efficiency and lowers error rates.

- *Internet of Things (IoT):* Applications for the Internet of Things (IoT) in the construction industry integrate sensors and devices to collect real-time data on a variety of topics, including equipment performance, energy use, and safety concerns. Proactive maintenance, resource optimisation, and enhanced safety management are made possible by this data-driven approach.
- *Sustainable Construction Technologies:* In order to encourage sustainability in the building sector, technology is essential. Reducing environmental consequences and achieving sustainable construction practises are made possible by innovations like green materials, energy-efficient systems, and the integration of renewable energy sources.
- *Project Management and Collaboration Tools:* Project management and collaboration in the construction sector have been transformed by a variety of software applications and cloud-based platforms. These tools help project teams better coordinate, schedule, share, and communicate, which increases productivity and decreases delays.

4. Relationship between Entrepreneurship and Construction Industry

Entrepreneurship and the construction industry are closely related, as entrepreneurship drives innovation and growth in the industry. In this relationship, entrepreneurship acts as a catalyst for change and helps create new opportunities in the construction industry.

Here's a diagram to illustrate the relationship between entrepreneurship and the construction industry:

- *Entrepreneurship:* This refers to the process of creating and developing a new business venture, typically with an innovative idea, product, or service. In the context of the construction industry, entrepreneurship can take many forms, such as starting a new construction company or developing new construction techniques or materials.
- *Opportunity:* Entrepreneurship often creates new opportunities for growth and innovation in the construction industry. These opportunities can come from identifying new market niches or developing new construction methods that are more efficient or sustainable.
- *Innovation:* Innovation refers to the process of creating something new or improving upon an existing product, service, or process. In the context of the construction industry, innovation can involve developing new building materials, construction methods, or technologies that improve the efficiency, safety, and sustainability of construction projects.
- *Growth:* Entrepreneurship and innovation can lead to growth in the construction industry as new companies, products, and services are introduced. This growth can lead to more construction projects and higher demand for construction workers, suppliers, and other related industries.
- *Construction Industry:* The construction industry encompasses all aspects of building and infrastructure development, including residential, commercial, and industrial construction. This industry is essential for economic growth and development, providing jobs and infrastructure that support communities and businesses.
- *Projects:* Construction projects are the end result of entrepreneurship, innovation, and growth in the construction industry. These projects can range from small renovations to large-scale infrastructure development projects, such as highways, bridges, and airports.

As shown in the diagram, entrepreneurship drives innovation and growth, which in turn creates new opportunities in the construction industry. These opportunities lead to new construction projects, which help drive the growth of the industry.

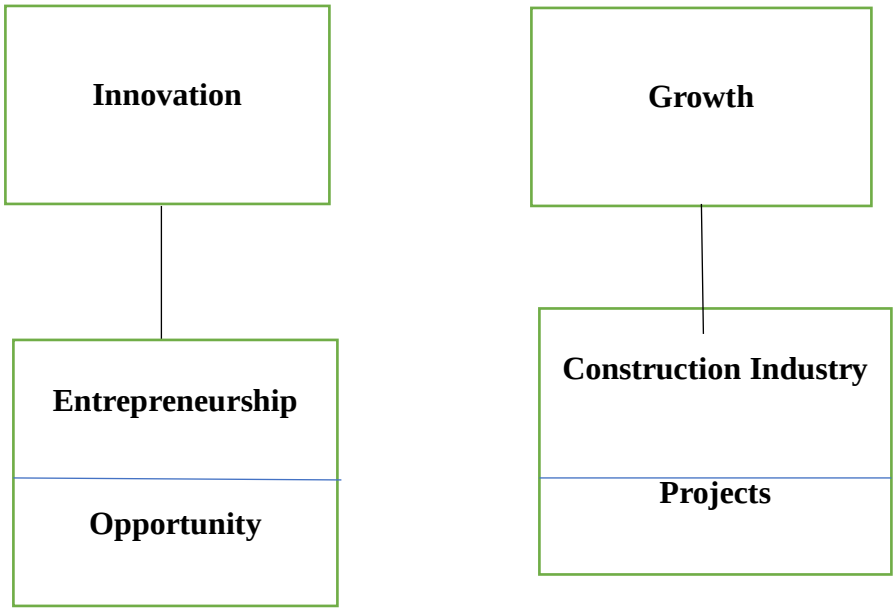

Figure 1: Relationship between Entrepreneurship and Construction Industry
(Source: Author)

In the construction sector, entrepreneurship can take many different forms, such as establishing a new business, creating novel building methods or materials, or discovering fresh market niches. In the building sector, entrepreneurship can also result in more competition and higher requirements for sustainability, quality, and safety.

4.1 Case studies related to entrepreneurship development in the construction and contracting industries

1. L&T Construction in India: L&T Construction, a renowned leader in engineering and construction, has worked on a number of illustrious infrastructure projects across India. The business has set up a specialised innovation centre that encourages staff members to come up with innovative ideas and cutting-edge technologies, placing a heavy emphasis on innovation and entrepreneurial endeavours. L&T Construction also places a high priority on employee training and development, which fosters an entrepreneurial spirit inside the company. This tactical move has been quite effective in preserving the company's competitiveness and securing its place as a major player in the Indian construction industry.
2. Skanska USA: American construction and development company Skanska USA gives innovation and sustainability a high priority. The business invented a number of cutting-edge building methods, including the ground-breaking "Green Wall" system, which uses live plants to enhance indoor air quality and lower energy usage in buildings. Through its Innovation Fund, which invests in cutting-edge technology and new business models, Skanska USA further helps the construction sector by providing funding and advice to start-ups and business owners. By using this strategy, Skanska USA has effectively surpassed its rivals and kept up its position as the industry leader in environmentally friendly construction methods.
3. Build Change in Indonesia: Build Change is a non-profit organisation that helps people create safer, more resilient homes by offering technical support and training to homeowners, contractors, and engineers in disaster-prone areas. Build Change is promoting the use of earthquake-resistant building methods and materials in Indonesia by collaborating with local business owners and contractors. These business owners are given training and technical assistance by the organisation, after which they become activists for safer construction methods in their localities. With the support of this strategy, a new market for earthquake-resistant buildings was established in Indonesia, which raised demand for safer housing. These case studies demonstrate the importance of entrepreneurship and innovation in the construction and contracting industries. By fostering a culture of entrepreneurship and providing support for innovative ideas and technologies, companies can stay competitive, create new markets, and drive growth in the industry.

5. Sample Analysis of a Building Project

5.1 Project: Construction of a Residential Complex

Overview:

A building company starts work on a project to build a residential complex with 100 units in a suburban location. To be completed, the project needs a substantial cash commitment, expert personnel, and cooperation from numerous stakeholders.

Profit and Loss Statement:

Revenue:

Contract amount: $20,000,000

Expenses:

Materials: $6,000,000

Labour: $8,000,000

Equipment rental and maintenance: $1,000,000

Overhead expenses (insurance, permits, etc.): $1,500,000

Marketing and advertising expenses: $500,000

Financing costs: $500,000

Legal and administrative expenses: $1,000,000

Total Expenses: $18,500,000

Profit: Total revenue - Total expenses = $1,500,000

Success Indicators:

- Completion of the project within the given timeline and budget
- High-quality construction and customer satisfaction
- Positive financial performance and profitability
- Compliance with safety and environmental regulations
- Strong partnerships and collaboration with stakeholders

Determinants of Success:

- Effective project management and coordination among various stakeholders
- Availability of resources and expertise
- Adherence to safety and environmental regulations
- Strong partnerships and collaboration with stakeholders

Construction projects like the building of a residential complex demand a sizable investment, careful planning, and specialised knowledge. Such projects' profitability and success depend on a number of variables, including good project management, respect for safety and environmental requirements, and cooperation with stakeholders. The profit and loss statement are a helpful tool for evaluating the project's financial performance and pinpointing potential improvement areas.

6. Conclusion

The significance of innovation and cutting-edge business methods within the building and contracting industries is the main emphasis of the paper. It offers a variety of strategies that business owners may use to improve their operations, including utilising cutting-edge technologies, forging strategic alliances, putting into practise sustainable business practises, and creating efficient finance and marketing plans. The document also acknowledges the difficulties faced by business owners in these sectors, such as a lack of skilled labour, constrained funding

alternatives, and the requirement to adhere to safety and environmental laws. In conclusion, this study adds to the body of information on entrepreneurship in the building and contracting industries by offering practical advice for entrepreneurs seeking to succeed. It emphasises the significance of adjusting to market conditions and embracing creative techniques to sustain competitiveness in the industry as a whole.

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