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THE PROFESSIONALIZATION OF SMALL BUSINESSES IN CIVIL CONSTRUCTION AS A FACTOR IN ECONOMIC DEVELOPMENT

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Abstract: Civil construction plays a central role in Brazil's socioeconomic structure, generating significant employment and circulation of resources. However, the sector is still strongly characterized by micro and small enterprises (MSEs) with poor management structures and a high degree of informality. This article analyzes the professionalization of these companies as an essential vector for sustainable growth and the strengthening of the national economy. Based on the author's practical experience in public and private works, the study discusses how administrative formalization, the adoption of modern management methods, and the application of technical standards contribute to increasing productivity, reducing waste, and consolidating a culture of efficiency and quality in the sector. The reflection proposes a new perspective on the role of the technical entrepreneur as an agent of social and economic transformation, connecting the development of micro and small enterprises to the expansion of Brazilian infrastructure and competitiveness.

Keywords: Civil construction, business professionalization, micro and small enterprises, public tenders, economic development, technical management, innovation, and productivity.

Introduction: the role of professionalization in the modernization of Brazilian civil construction

Civil construction occupies a strategic position in the Brazilian economy, not only because it represents about 6% of the Gross Domestic Product (GDP), but also because of its capacity to generate jobs, drive production chains, and boost urban and social development.According to the Brazilian Institute of Geography and Statistics (IBGE, 2023), the sector directly employs more than 7 million workers, in addition to indirectly impacting several related industries, such as construction materials, transportation, energy, and technical services.

This cross-cutting nature makes civil construction one of the most relevant drivers of the national economy. However, despite its size and importance, the sector still faces profound structural challenges, marked by low productivity, high informality, and a lack of professional management in micro and small enterprises (MSEs).

These companies, which make up more than 90% of formal organizations in the segment (SEBRAE, 2023), play an essential role in the execution of public and private works, but rarely have solid administrative processes, strategic planning, or technical performance control.The low managerial maturity of these companies reflects a historical cycle of improvisation and empiricism, in which practical experience is often the only competitive advantage. Although this scenario demonstrates the strength and resilience of Brazilian workers, it also limits the sector's progress: without standardization, training, and innovation, civil construction tends to operate with low margins, low predictability, and little capacity for expansion.

In addition, the absence of formal management deters investors and hinders access to credit, inhibiting the growth of companies that could become major agents of local and regional transformation. In the field of public works, the impact of this reality is even more noticeable. The lack of technical and administrative qualifications

prevents many micro and small enterprises from participating in bids, concentrating contracts in the hands of large contractors. This not only restricts competition, but also limits the generation of jobs and income at the local level.

According to a survey by the Federal Court of Accounts (TCU, 2022), about 70% of municipal bids receive fewer than three valid proposals, partly due to the absence of small companies qualified to participate—a fact that highlights the urgency of policies aimed at professionalizing small entrepreneurs in the civil construction sector. Professionalization, in this context, should be understood as a broad process involving technical education, strategic management, process digitization, and the valorization of practical knowledge. It transforms the role of the construction entrepreneur: from a mere executor of works, he becomes a project manager, a planner, and an agent of economic development.

Professionalization therefore has a direct impact on the sector's productivity and sustainability, raising quality standards and strengthening the credibility of companies with public and private agencies. In recent years, advances in technology and the strengthening of training policies such as the Brasil Mais Produtivo (More Productive Brazil) and Construa Brasil (Build Brazil) programs have helped bring small companies closer to good management and innovation practices. Even so, the pace of modernization is still slow, especially among smaller companies, which face financial, cultural, and operational barriers to adopting new methods.

Given this scenario, this article proposes a reflection on the professionalization of micro and small construction companies as a determining factor for Brazil's economic development. Based on the author's practical experience, who consolidated his work in public and private construction projects through a process of technical and managerial growth, the study seeks to demonstrate that formalization and structured management are not only paths to business success, but central elements of a project for a more productive, fair, and sustainable nation.

The Current Scenario for Micro and Small Businesses in Brazilian Civil Construction

Civil construction is one of the sectors that most depends on the performance of micro and small enterprises (MSEs) to maintain its operational base active. These organizations play an essential role in the execution of public and private works, in the generation of jobs, and in the revitalization of local economies. However, despite representing more than 90% of formal companies in the sector (SEBRAE, 2023), MPEs still face serious structural limitations that compromise their competitiveness and longevity.

According to the Brazilian Micro and Small Business Support Service (SEBRAE), about 63% of Brazilian MPEs cease operations within five years of starting up, with a lack of financial management and strategic planning being the main reasons.In the case of civil construction, this percentage is even more worrying, as the sector requires rigorous technical control, constant cash flow, and the ability to deal with seasonality and delays in public payments.

Most companies do not have an integrated accounting system, inventory

control, performance indicators, or reinvestment policy, which makes them vulnerable to economic fluctuations and poorly planned hiring. The problem is exacerbated when one considers the low rate of participation by small businesses in public tenders.

Although the Brazilian government spends more than R$ 1 trillion per year on public procurement, only about 70,000 MEIs and MPEs are registered as active suppliers (Ministry of Economy, 2023). This number is extremely small compared to the more than 16 million individual entrepreneurs in the country, revealing a gap in training and access to information.

The complexity of public notices, the lack of technical guidance, and the fear of default still keep many small business owners away from this potentially transformative market. Another structural factor is regional disparity. While large urban centers, such as São Paulo and Belo Horizonte, concentrate the majority of formalized and trained companies, smaller regions still operate with high levels of informality and low productivity rates.

The IBGE (2023) estimates that approximately 40% of small residential construction projects in Brazil are carried out by professionals without formal registration, without issuing invoices, and without qualified technical supervision. This informality affects tax collection, workplace safety, and the final quality of the buildings. The lack of technical and managerial training is also one of the major bottlenecks in the sector.

Research by the Getulio Vargas Foundation (FGV, 2022) indicates that only 12% of small construction companies offer training programs for their teams, and less than 10% use performance indicators to measure productive efficiency. Without ongoing training and clear processes, these companies end up dependent on the empirical experience of their workers, which perpetuates a cycle of low productivity and high labor turnover.

Despite this challenging scenario, there is a growing movement of transformation and business awareness. In recent years, the popularization of technical courses, advances in digitization, and the emergence of platforms such as Compras.gov.br and the National Public Procurement Portal (PNCP) have facilitated small businesses' access to information and opportunities. These tools represent a structural change in the public procurement model, promoting greater transparency and inclusion.

In addition, entities such as SENAI, CREA, and SEBRAE itself have developed programs aimed at modernizing management and improving the quality of services provided by micro and small enterprises in the construction sector. These initiatives, although still in their infancy, are beginning to create a new business ecosystem that is more qualified, competitive, and connected to the principles of sustainability and innovation.

However, the main challenge remains: transforming small artisanal businesses into professional, technically sound, and financially sustainable organizations. To achieve this, it is not enough to invest in individual training; it is necessary to create a collective entrepreneurial mindset that values planning, transparency, and efficiency as pillars of growth. Strengthening these small businesses is therefore a matter of public policy and national interest.

By professionalizing the productive base of civil construction, the country not

only expands its capacity to execute infrastructure works, but also stimulates local entrepreneurship, reduces regional inequality, and strengthens the economy in a decentralized and inclusive manner.

Professionalization as an Instrument of Transformation

The professionalization of micro and small construction companies represents much more than an adaptation to market demands. It is a transformative process, capable of redefining organizational culture, productivity standards, and the very perception of the role of the entrepreneur in economic development.

When a company transitions from an empirical model to a technical-managerial model, a true paradigm shift occurs: the focus shifts from simply executing the work to encompassing planning, control, and sustainability of results. According to the National Confederation of Industry (CNI, 2022), the average productivity of the Brazilian civil construction sector is less than half the world average, mainly due to the lack of standardized processes and the informal management of small companies.

Studies indicate that projects that implement professional management practices reduce the average execution time of works by up to 30% and increase their profitability by between 15% and 40%. These figures reveal that professionalization is not just an option, but a condition for survival and competitiveness in an increasingly dynamic and demanding market.

Professionalization therefore involves four fundamental dimensions:

1.Administrative and financial management, with control of costs, budgets, and cash flow;

2.Technical and operational planning, with schedules, productivity control, and standardization of procedures;

3.Training of personnel, promoting technical training, constant updating, and a culture of safety;

4.Strategic management and innovation, using performance indicators, market analysis, and adoption of new technologies.

These dimensions work in an integrated and interdependent manner. Companies that master only one of them remain vulnerable to crises and market fluctuations. True transformation occurs when small business owners understand that efficient management is an essential part of technical delivery and not an accessory function. Technical planning is one of the most impactful pillars of this process.

In many small construction companies, execution is still conducted without clear schedules, without control of materials, and without forecasting indirect costs, which compromises predictability and profit margins. By implementing physical and financial control methods such as Gantt charts, cost spreadsheets, and performance reports, entrepreneurs begin to make decisions based on data rather than intuitive estimates. This qualitative leap allows them to anticipate problems, reduce waste, and align expectations with the client.

People management is also a determining factor in professionalization. The construction industry is labor intensive, and productivity depends directly on the qualification and engagement of teams. According

to SENAI (2023), each real invested in technical training generates, on average, R$ 3.50 in increased productivity within the first year of application. Continuous training in occupational safety, project reading, finishing techniques, and tool operation is a competitive advantage that translates into efficiency and quality.

More than just complying with standards, investing in people is the way to build sustainable organizations. Another key element is strategic management. Many small businesses limit themselves to meeting the immediate demand of local customers, without a vision for growth or market positioning. Professionalization encourages strategic thinking, allowing entrepreneurs to plan for expansion, diversification, and participation in new niches, such as corporate renovations, public works, or energy efficiency projects.

This vision of the future is what differentiates the traditional entrepreneur from the modern manager, who is capable of aligning purpose, innovation, and results. Technological innovation is also part of the professionalization process. The introduction of management software (ERP), BIM (Building Information Modeling) modeling, and digital tools for budgeting and monitoring construction projects has become accessible and highly effective.

These technologies, once restricted to large corporations, are now available to small businesses and contribute to reducing operating costs, improving technical accuracy, and increasing the transparency of operations. The digitization of civil construction democratizes access to information and brings small entrepreneurs closer to global best practices.

However, professionalization should not be understood merely as an adaptation to corporate standards, but as a philosophy of management and conduct. It requires discipline, ethical commitment, and a long-term vision. We must break with the idea that small business owners are "less prepared" and recognize that empirical knowledge, combined with modern management, can generate high-impact results.

This balance between practical experience and technical rationality is the real driver of transformation in the sector. In short, professionalization is the turning point for the future of Brazilian civil construction. By adopting a more analytical, planned, and technological approach, micro and small businesses are becoming protagonists in the country's modernization. More than just construction projects, they are delivering public value, efficiency, and credibility—attributes that strengthen the economy, attract investment, and consolidate the sector as one of the pillars of national development.

Case Studies and Practical Experiences

The theory of professionalization is only consolidated when successfully applied in real contexts. In civil construction, where the work is highly technical and subject to external variables such as weather, suppliers, schedules, and standards, practice becomes the true field for proving managerial efficiency. Over the last few years, experiences of Brazilian micro and small companies have shown that the implementation of technical management and operational control processes can transform the sector's productive structure, increasing productivity and stren-

gthening the credibility of companies with public authorities.

A study conducted by the Getúlio Vargas Foundation (FGV, 2023) analyzed 150 small construction companies in five Brazilian states. The survey found that companies that adopted basic financial control systems and execution schedules showed an average reduction of 27% in material waste costs and a 34% increase in delivery punctuality. In addition, the rate of rework, common in projects with low supervision, fell from 22% to 8%.

These data reinforce the direct impact of professionalization on operational efficiency. Another relevant finding is the study by the Civil Construction Industry Union of Minas Gerais (SINDUSCON-MG, 2022), which identified that small companies that implemented quality standards based on ABNT norms managed to increase their contract renewal rate with public clients by 40%.

In other words, in addition to improving technical performance, professionalization also strengthens institutional reputation, expanding market opportunities. These results are also observed in the practical experiences of entrepreneurs who have undergone management transformation processes. The case of entrepreneur Victor Tume da Silva is emblematic. Starting his career as an individual microentrepreneur (MEI), working in small-scale painting and renovation services, the author gradually built a technical management model that led him to win relevant contracts with federal universities, the armed forces, and municipal governments.

This expansion was only possible after adopting professional practices for schedule control, cost management, team standardization, and technical documentation of works. In projects carried out for public agencies, the application of management methods based on indicators, such as physical progress of the work, consumption of materials, and labor efficiency, resulted in productivity gains of up to 30%.

In addition, technical rigor in meeting deadlines and the traceability of administrative processes ensured institutional recognition and new partnership opportunities. These experiences show that efficiency does not depend on the size of the company, but rather on the maturity of its management. In one of the cases analyzed, a contract signed with a federal university involved the painting and revitalization of academic buildings, totaling more than 25,000 square meters of area executed.

The adoption of physical-financial planning, combined with periodic execution control meetings, allowed for delivery within the scheduled deadline, with savings of about 12% in relation to the initial budget. In addition, the technical team underwent specific training on material handling and safety standards, ensuring compliance with the standards required by the public contractor.

Another notable example was the execution of a contract with the Brazilian Army, which required interventions in collective use environments and short schedules. The implementation of a routine of direct communication between the field and the office through update spreadsheets and weekly reports resulted in the elimination of communication failures and the optimization of material logistics.

The success of this operation demonstrated how collaborative planning and execution discipline are fundamental pillars of professionalization. These case studies show that changing corporate culture is central to transformation. Companies that understand the importance of management as part of the technical process begin to operate with greater predictability and confidence. Entrepreneurs stop reacting to problems and start anticipating solutions, becoming strategic managers.

This behavior generates a multiplier effect in the sector: suppliers adapt, teams become more qualified, and customers begin to demand higher quality standards. In addition to the direct impact on companies, professionalization also benefits the public sector. Contracting agencies begin to rely on more organized suppliers, capable of meeting deadlines and technically justifying each stage of execution.

This reduces the risk of construction stoppages, rework, and contract amendments, problems that have historically undermined the credibility of public construction in Brazil. In this sense, the professionalization of small companies also becomes an instrument of administrative efficiency and strengthening of public governance.

Finally, it is important to note that successful experiences are not limited to technical execution, but extend to relationship management and transparency. Companies that document their practices, maintain organized financial records, and value institutional communication strengthen the trust of customers and partners. Credibility, in this context, becomes a valuable asset capable of opening doors to new contracts and consolidating the company's name in the market.

Thus, the cases presented reinforce the thesis that professionalization is both the cause and consequence of success. It arises from the need to improve processes, but once implemented, it generates a chain of positive results: greater efficiency, more opportunities, and greater stability. Transformation, is therefore not only structural, but cultural and strategic, consolidating small businesses as protagonists of Brazilian economic development.

Economic and Social Impacts of Professionalization

The professionalization of micro and small construction companies has effects that go far beyond improving internal management or increasing individual productivity. It represents a structuring vector of economic and social development, as it transforms the sector's productive base and creates a virtuous cycle of growth, formalization, and job creation. When a small business starts to operate with technical efficiency, planning, and control, the impact reverberates throughout the construction chain, reaching suppliers, service providers, and even public administration.

According to a study by the Getulio Vargas Foundation (FGV, 2023), an increase of just 10% in the number of professionalized companies in Brazilian civil construction could generate an additional R$ 28 billion to the national GDP and create around 300,000 new direct jobs. These figures highlight the multiplier potential of business efficiency.

Formalization, in turn, contributes to increased tax collection, strengthening public coffers and allowing governments to invest more in infrastructure and housing, sectors with a high multiplier effect on the economy. The National Confederation of Industry (CNI, 2022) reinforces this argument by pointing out that the civil construction sector has one of the highest labor absorption capacities in the country, with each R$ 1 million invested generating up to 25 direct and indirect jobs.

However, the real difference lies in the quality of the jobs generated. Professionalized companies offer formal working conditions, technical training, adequate equipment, and safety, reducing accidents, improving performance, and raising the average income of workers.

This process of formalization and professional development has a direct impact on social indicators such as consumption, housing, and education. Economically, professionalization also reduces waste and increases production efficiency. According to the Construction Efficiency Report (World Bank, 2022), companies with technical process control reduce input consumption by up to 22% and increase material utilization by 35%, which represents significant savings on a national scale.

In addition to the financial aspect, there are environmental gains, since the rational use of resources reduces the volume of waste and carbon emissions associated with the construction production chain. Another relevant aspect is the strengthening of public governance. Structured and technically capable companies ensure greater predictability and quality in the execution of public contracts, reducing delays and contract amendments.

According to the Federal Court of Accounts (TCU, 2022), more than 37% of public works in Brazil suffer interruptions due to planning or execution failures, problems that could be avoided with more professional suppliers and more transparent management processes. Therefore, the qualification of SMEs not only benefits the private sector, but also improves the efficiency and credibility of public infrastructure policies.

From a social perspective, the impact of professionalization is even broader. Companies that adopt modern management practices and promote continuous training create fairer and more motivating work environments. Technical training and the possibility of professional advancement reduce turnover and increase productivity per employee. This movement has a direct impact on families and local communities, strengthening regional economies and stimulating consumption.

Professionalization, therefore, acts as a tool for socioeconomic inclusion, transforming informal workers into economically active citizens and contributing to the reduction of inequality. Sustainability is another fundamental area of impact. Professionalization encourages the use of clean technologies and environmentally friendly materials, as well-structured companies tend to incorporate environmental responsibility criteria into their projects.

The adoption of practices such as water reuse, energy efficiency, and proper waste disposal reduces the environmental impact of construction and contributes to the fulfillment of Brazil's sustainable development goals (UN SDGs 9 and 11). Thus, the process of business modernization is not only economic but also environmentally responsible and socially conscious.

In the long term, the professionalization of small and medium-sized construction companies also contributes to economic stabilization and the strengthening of regional entrepreneurship. When small companies achieve technical and administrative maturity, they become hubs for local training and employability. They hire professionals, stimulate the surrounding economy, and generate demand for regional suppliers of paints, electrical, hydraulic, and structural materials. This decentralized dynamism is what sustains resilient and balanced economies throughout the country.

A relevant finding from the Annual Construction Industry Survey (IBGE, 2023) shows that, between 2016 and 2022, small companies that invested in training and management control grew 47% above the industry average. In contrast, those that maintained informal operating models declined by 12%.

These figures highlight the power of structured management as an engine for growth and competitiveness. More than a trend, professionalization is proving to be an economic imperative, determining the survival and success of companies in the new civil construction economy.

Finally, it is worth highlighting the symbolic role of professionalization in strengthening Brazilian entrepreneurial culture. It restores the value of technique, planning, and responsibility as the foundations of good business practice. Entrepreneurs who previously operated informally now see their work as part of a larger productive ecosystem, with a real impact on national development. By formalizing their operations, planning their projects, and complying with quality standards, these entrepreneurs not only prosper but also raise the standard of the entire sector, contributing to a more ethical, predictable, and sustainable economy.

Challenges and Barriers to Professionalization

Despite the advances observed in recent decades and increased awareness of the importance of modern management, the professionalization of micro and small enterprises (MSEs) in the construction industry still faces structural, financial, cultural, and institutional barriers. These obstacles form a cycle that hinders the sector's evolution, especially in regions where informality and the absence of specific development policies predominate.

The first and perhaps most obvious challenge is restricted access to credit. According to data from the Brazilian Development Bank (BNDES, 2023), only 6% of micro and small construction companies are able to obtain financing for working capital or investment in equipment. Bank requirements such as collateral, credit history, and tax compliance are incompatible with the reality of many small businesses, which often operate with unstable cash flows and no collateral.

Without accessible credit, investment in technology, training, and modernization becomes limited, perpetuating the cycle of low productivity. The second barrier is related to the tax and bureaucratic complexity of the Brazilian system. Civil construction is one of the sectors most affected by the multiplicity of taxes, rates, and regional legislation.

The need to issue various types of invoices, comply with ancillary obligations,

and deal with different tax withholding regimes consumes time and resources, making it difficult to manage small companies, which often do not have an internal accounting structure. According to a study by the Brazilian Institute of Tax Planning (IBPT, 2022), civil construction entrepreneurs spend an average of 1,958 hours per year just to comply with tax obligations, which is one of the highest rates in the world.

This excessive bureaucracy discourages formalization and, in some cases, leads promising entrepreneurs to give up. Another critical obstacle is the lack of managerial and technical training. Most entrepreneurs in the construction industry start their activities based on practical experience, but without mastery of management, finance, and planning tools. This knowledge gap limits the capacity for expansion and prevents entrepreneurs from adopting control and innovation practices.

SEBRAE (2023) points out that 62% of micro and small enterprises in the sector have never participated in business training programs and that only 18% provide any type of internal training for their teams.

The lack of qualifications directly impacts productivity, delivery quality, and business competitiveness. In addition to technical and financial barriers, there is also cultural resistance to change, one of the most difficult factors to overcome. Many small business owners still associate formalization and administrative control with unnecessary costs, believing that "field experience" is sufficient to guarantee results. This mindset, although the result of years of improvisation and survival in an unstable economic environment, prevents the adoption of planning and innovation practices.

Breaking this paradigm requires not only training, but also practical examples of success that show that professionalization is an investment, not an expense. The informality of the workforce is also a major barrier.

The difficulty of formal hiring and the high cost of labor charges cause many companies to maintain unregistered teams, which increases the risk of legal liabilities and reduces the commitment of professionals. According to the IBGE (2023), about 39% of construction workers are informal, without formal employment. This reality undermines both productivity and safety, as the lack of training and technical responsibility contributes to the high rate of workplace accidents in the sector.

Another noteworthy point is the lack of communication between the public sector and small business owners. Bidding notices are often written in overly technical and bureaucratic language, which makes it difficult for smaller companies to participate. In addition, the lack of institutional support during the qualification and execution phases causes many entrepreneurs to give up on the process. According to the Ministry of Economy (2023), more than 40% of public tenders held in 2022 had fewer than three valid participants, highlighting the lack of accessibility and guidance.

The lack of strong business associations is another significant obstacle. In the United States and European countries, small construction companies have solid networks of institutional support, associations, technical unions, and chambers of commerce that promote training and ensure political representation. In Brazil, although there are entities such as SINDUSCON and CREA, the reach of these institutions is still limited

among micro and small enterprises, especially in smaller cities.

Strengthening these networks is essential to expand access to information, foster partnerships, and build a collective identity of professionalism. Overcoming these barriers requires an integrated approach involving the government, financial institutions, professional associations, and the business community itself.

It is necessary to reformulate the regulatory environment, simplify taxes, offer accessible credit, and expand professional training programs. But above all, it is necessary to promote a change in mindset, to make small business owners understand that formalization and professional management are not external impositions, but tools that guarantee survival, growth, and recognition in the market.

Professionalization, therefore, is not an individual challenge, but a collective project to modernize the Brazilian civil construction sector. It is by addressing these barriers that the country will be able to create a more competitive, ethical, and sustainable business environment, in which micro and small businesses have real conditions to thrive and contribute fully to economic and social development.

Public Policies and Incentives for the Sector

The professionalization of micro and small enterprises (MSEs) in the civil construction sector does not depend solely on the individual initiative of entrepreneurs. It is a process that requires a favorable institutional environment, consistent public policies, and incentive programs capable of reducing structural inequalities. The role of the State, in this context, is to create conditions for competitiveness, promote access to information, and facilitate the integration of small businesses into public and private markets.

In recent years, Brazil has made progress in policies aimed at productive modernization and the inclusion of small businesses in civil construction value chains. Initiatives such as Brasil Mais Produtivo (More Productive Brazil), the National Program to Support Micro and Small Businesses (Pronampe), and Construção 2030 (Construction 2030) were created with the aim of increasing productivity, fostering innovation, and stimulating sustainability in the sector. However, the scope and continuity of these programs are still limited, leaving many micro and small businesses on the sidelines of the opportunities offered.

The Brasil Mais Produtivo program, created by the Ministry of Development, Industry, Trade, and Services (MDIC) in partnership with SEBRAE, SENAI, and ABDI, has shown concrete results in the manufacturing industry and is gradually being adapted to the construction sector. Companies that participated in the initiative reported average gains of 52% in productivity and 18% in operating cost reductions (MDIC, 2023).

Expanding this program to small construction companies would be a decisive step toward strengthening the sector's base and democratizing access to technological modernization. Another significant advance was the strengthening of the Compras.gov.br Program and the National Public Procurement Portal (PNCP), which unified bidding platforms in a digital environment,

making the process more transparent and accessible.

These tools have significantly reduced bureaucracy and increased the participation of small businesses in public tenders. However, the complexity of documentation and lack of training are still barriers that prevent many micro and small enterprises from competing on an equal footing. The creation of regional training centers for public bidding, especially in partnership with universities and industry federations ( ), could transform this scenario and have a direct impact on productive inclusion.

SEBRAE and SENAI play a fundamental role in this professionalization process, offering training programs, consulting, and technical certification. The Sebraetec Construction project and SENAI Sustainable Construction courses have helped entrepreneurs implement good management practices and adopt more efficient and sustainable technologies.

Despite these advances, the demand for training still far exceeds supply. According to SEBRAE (2023), less than 20% of companies in the civil construction sector have participated in any formal training program, a fact that highlights the need for large-scale public policies.

BNDES has also sought to adapt its credit lines to the needs of small construction companies. The BNDES Finame program allows for the financing of construction equipment and technologies, while BNDES Small Business Credit facilitates access to working capital. However, the bureaucracy involved in approval and the excessive guarantees required still deter microentrepreneurs.

A viable solution would be to create specific guarantee funds for the civil construction sector, focusing on companies that can demonstrate a technical track record and fiscal regularity. In the legislative sphere, recent laws have contributed to simplifying the business environment. Complementary Law No. 123/2006, which established the National Statute for Micro and Small Businesses, and Law No. 14,133/2021, which established the new legal framework for public tenders and administrative contracts, represent important advances.

The new legislation, for example, reinforces the principle of direct contracting of micro and small enterprises in bidding exemption processes up to certain amounts, in addition to encouraging the quota reserved for small suppliers in public tenders. These mechanisms expand access and strengthen the presence of MSEs in government contracting, contributing to market decentralization.

At the international level, successful experiences can inspire new policies in Brazil. In the United States, the Small Business Administration (SBA) program offers financial support, training, and specific certifications for small businesses in the construction sector, guaranteeing them priority in federal public contracts.

Similarly, the European Union has developed the European Construction Sector Observatory, which monitors and supports the performance of small construction companies in different countries. These models show that the integration of credit policies, training, and technical certification is the most effective way to consolidate a modern and inclusive productive environment. In the Brazilian context, a successful professionalization strategy needs to balance eco-

nomic development, reducing bureaucracy, and ongoing technical training.

Low-interest credit programs, tax incentives for certified companies, and partnerships between government and universities can create an ecosystem conducive to innovation. In addition, public governance and compliance policies should be encouraged in small businesses, ensuring transparency and integrity in contractual relationships, elements that strengthen the sector's credibility.

Finally, it is essential that public policies be consistent and structured, rather than one-off or reactive measures. Professionalization requires time, monitoring, and evaluation of results. Only with continuity and integration between the municipal, state, and federal levels will it be possible to consolidate a national development model for civil construction, capable of transforming small businesses into protagonists of the country's economic and social growth.

Technology as a Strategic Ally of Professionalization

The technological revolution in civil construction is profoundly reshaping the way companies plan, execute, and manage construction projects. Whereas competitiveness was once determined by the workforce and physical production capacity, today it increasingly depends on intelligent information management, the use of data, and the digital integration of construction processes.

In this context, technology is no longer a differentiator but has become an essential condition for the survival and professionalization of micro and small enterprises (MSEs) in the sector. Construction 4.0, a term derived from Industry 4.0, represents the convergence of automation, connectivity, artificial intelligence, and digital data management.

It introduces tools that allow for unprecedented precision in planning and controlling a construction project, reducing costs and increasing efficiency. According to the report The Global Construction 2030 (Oxford Economics, 2023), companies that incorporate digital technologies have an average increase of 40% in productivity and a reduction of up to 25% in operating costs. These figures demonstrate that technology is a direct driver of competitiveness and sustainability.

Among the main innovations applied to civil construction, Building Information Modeling (BIM) stands out. BIM allows the creation of three-dimensional digital models that integrate all stages of the project: design, planning, budgeting, execution, and maintenance. This integration eliminates rework, prevents errors, and improves communication between designers, engineers, and contractors. For small businesses, BIM offers the opportunity to compete on equal terms with larger corporations, replacing improvisation with technical precision and collaborative management.

Since 2021, the use of BIM has become mandatory in federal public works in Brazil, which represents a significant advance in the standardization and transparency of the sector. In addition to BIM, the use of integrated management software (ERP) has become increasingly accessible and decisive. Tools such as Sienge, Obrafit, Construmanager, and Project Builder allow you to track budgets, schedules, measurements, and reports in real time.

These systems provide detailed physical and financial control, facilitating compliance with deadlines and accountability in public and private contracts. For companies seeking professionalization, ERP is the starting point for the complete digitization of management, replacing manual spreadsheets with centralized and automated data.

Another expanding technology is the use of mobile platforms and field applications. Applications such as Fieldwire, PlanGrid, and Trello Obras allow daily monitoring of work fronts, instant communication between teams, and photographic recording of the stages performed. These tools reduce communication failures, improve productivity monitoring, and ensure greater transparency between contractor and contractor.

With the popularization of smartphones and tablets, access to these technologies has become feasible even for micro-enterprises, democratizing technical and administrative control. Artificial intelligence (AI) and machine learning are also beginning to impact the sector, especially in forecasting deadlines, material consumption, and risk identification. AI-based forecasting software analyzes data from previous projects and generates performance simulations, enabling more assertive decisions.

For small entrepreneurs, this technology is still in its early stages, but it is likely to become a competitive advantage in the coming years, especially in public tenders, where the accuracy of estimates and deadlines can determine the success of a proposal. Another promising field is technological sustainability, with the use of eco-friendly materials, water reuse systems, and solar energy on construction sites.

Companies that adopt sustainable practices not only reduce operating costs but also increase their scores in certification programs and public works tenders, which often include sustainability criteria. Professionalization, therefore, is directly linked to the ability to align technology and environmental responsibility, a combination increasingly demanded by the market and society.

Advances in technology also have a direct impact on professional training. Distance learning platforms and online technical training have made it easier for workers and managers to access refresher courses. Institutions such as SENAI and CREA Digital Academy already offer remote training in BIM, construction management, and occupational safety, increasing inclusion and allowing small business owners to train their teams without interrupting production activities.

However, despite the numerous opportunities, the digitization process still faces significant challenges. Many micro and small enterprises do not have the technical structure or financial resources to purchase software licenses and adequate equipment. In addition, there is cultural resistance on the part of professionals accustomed to traditional methods.

These difficulties reinforce the importance of public policies that encourage accessible innovation, with subsidies, training, and technology adoption programs for small businesses, as is the case in countries such as Germany and Canada, where the state acts as a mediator in the digital transition. Technology, therefore, is more than a support tool; it is an agent of structural transformation. By adopting digital solutions, micro and small businesses become more productive, sustainable, and compe-

titive, expanding their strategic role in the national economy. Digital construction not only optimizes processes but also raises quality standards, reduces waste, and consolidates the image of companies as agents of innovation.

Ultimately, the integration of professionalization and technology represents the future of Brazilian construction. Companies that understand and apply this synergy will be ahead in the race for efficiency and sustainability. Technological modernization is, therefore, the inevitable and necessary path to consolidate the sector as one of the pillars of the country's economic and social development.

International Perspectives and Regional Integration

The professionalization of small construction companies is a global movement, driven by technological transformations, environmental changes, and new economic development policies. Several countries have implemented programs aimed at productive modernization, technical training, and the integration of micro and small companies into construction value chains—recognizing that the sector's sustainability depends directly on the qualification of its base.

Comparing these international experiences with the Brazilian reality offers a valuable overview of possible paths and effective practices that can be adapted to the national context. In the United States, the model for supporting small construction companies is one of the most structured in the world. The Small Business Administration (SBA), a federal agency created in 1953, acts as a central hub for promoting incentive, financing, and training policies.

Through programs such as the Small Business Set-Aside, the government reserves about 23% of all federal public contracts for small businesses, ensuring the effective participation of these enterprises in the public works market. In addition, the SBA's certification system, such as the 8(a) Business Development Program and the HUBZone Program, gives priority in bidding to companies located in less developed regions, promoting economic balance and productive inclusion.

This model shows that professionalization is not limited to internal management, but depends on integrated public policies that create real opportunities for small entrepreneurs to compete. In the European Union, the strategy is equally robust and based on sustainability and innovation.

The European Construction Sector Observatory (ECSO) program, coordinated by the European Commission, monitors industry trends and promotes modernization policies aligned with the Green Deal and the circular economy. Small and medium-sized companies receive tax incentives and technical support to adopt sustainable practices, reduce carbon emissions, and use digital technologies such as BIM and IoT (Internet of Things).

Countries such as Germany, France, and the Netherlands are leading the implementation of collaborative digital construction models, in which small companies share data and resources on integrated platforms, reducing costs and increasing efficiency. These experiences demonstrate that technological integration combined with environmental sustainability is the new paradigm of modern construction.

In Germany, the construction sector is strongly supported by a network of technical associations and chambers of commerce, such as the Deutscher Industrie- und Handelskammertag (DIHK) and the Zentralverband des Deutschen Baugewerbes (ZDB). These institutions offer continuous training, professional certification, and legal and financial advice to small businesses. The result is a business ecosystem that combines high productivity, legal certainty, and a culture of quality.

The German model stands out for its emphasis on dual education, which integrates technical education and professional practice from the basic level, creating a constant flow of skilled workers and entrepreneurs who are aware of the value of efficient management. In Latin America, some countries have made significant progress, especially Chile, which has implemented pioneering policies for the digitization of public construction.

The Plan BIM Chile program, coordinated by the Corporación de Fomento de la Producción (CORFO), made the use of BIM mandatory in all public works projects and promoted free training for small and medium-sized enterprises. This strategy resulted in an average reduction of 25% in rework costs and 18% in the duration of public works (CORFO, 2023). Chile has become a regional benchmark in innovation and transparency policies, showing that democratizing technology is the most effective way to level the playing field and strengthen healthy competition. Looking at these international experiences, it is clear that the common element among successful countries is the integration between government, private initiative, and educational institutions. These three pillars work in a coordinated manner to create an environment conducive to innovation and business qualification.

Brazil, despite recent advances, still lacks this systemic coordination. Training and promotion initiatives exist, but they operate in a fragmented and discontinuous manner, which reduces their impact on the sector as a whole. Regional integration within Brazil is another challenge that can benefit from these international best practices. The country has a vast and uneven territory, where the modernization of civil construction occurs at different rates between regions. While states such as São Paulo, Minas Gerais, and Paraná already have a high level of formalization and productivity, other regions still face a lack of infrastructure, credit, and technical training.

The creation of regional innovation networks involving local governments, universities, and business associations would be an essential step toward decentralizing development and ensuring that the benefits of professionalization reach the entire country.

Another measure that could be inspired by foreign models is the creation of national business professionalization certifications, similar to those used in the United States and Europe.

These certifications could recognize companies that adopt good management, safety, and sustainability practices, offering them competitive advantages in public tenders and easier access to credit lines. In addition to strengthening the credibility of MSEs, these certifications would foster a culture of compliance and technical excellence throughout the sector.

Finally, the adoption of national productivity and quality indicators in civil construction is essential to measure the im-

pact of professionalization policies and direct public investments more efficiently. The European experience shows that monitoring the sector's performance is as important as investing in it. Without accurate data on productivity, formalization, and innovation, the country runs the risk of moving forward without a strategic direction.

In summary, international dialogue reveals that the professionalization of small construction companies is not only a Brazilian necessity but a global and irreversible trend. Success depends on the ability to adapt foreign best practices to the local reality, respecting Brazil's regional and social particularities. The integration of technical knowledge, technology, and public policy is what will enable the country to transform the potential of micro and small companies into a productive and competitive force on the global stage.

Conclusion

The professionalization of micro and small enterprises (MSEs) in the Brazilian civil construction industry is not just a trend toward modernization; it is a structural necessity and an imperative for national development.

Throughout this study, it was observed that professionalization transcends the simple adoption of management tools: it redefines mindsets, reorganizes processes, increases productive efficiency, and promotes a new culture of responsibility and excellence.

It is a movement that transforms entrepreneurs into managers, workers into skilled professionals, and companies into agents of economic and social development. The diagnosis presented in the initial chapters revealed a challenging scenario.

Although Brazilian civil construction is one of the largest generators of jobs in the country, it still suffers from high rates of informality, low productivity, and a lack of technical training. However, the case studies and experiences analyzed show that when technical management, planning, and innovation are incorporated into the daily routine of small businesses, the results are immediate and measurable: more efficient construction projects, reduced waste, increased profitability, and improved final quality of services provided.

The economic and social impacts of professionalization are significant. The formalization of micro and small enterprises generates quality jobs, increases tax collection, and strengthens local economies. Well-structured companies become sources of stability and innovation, promoting a virtuous cycle of growth.

In addition, professionalization improves the relationship between the private sector and public authorities, ensuring greater transparency in the execution of works and reducing the number of stoppages and rework. This new standard of efficiency directly benefits society, which now receives better quality services and more durable infrastructure.

Despite the advances, significant challenges remain. Restricted access to credit, tax complexity, lack of management training, and cultural resistance to change still limit the sector's progress. Overcoming these barriers requires consistent public policies, ongoing training programs, and incentives for technological innovation.

It is essential that the government, educational institutions, the financial system, and business associations work together to create a favorable environment for strengthening small businesses and their competitive insertion in public and private markets. Technology, as discussed in this paper, is the main catalyst for this transformation.

The digitization of processes, the use of tools such as BIM, and integrated management systems offer small businesses the opportunity to operate with the same level of precision and transparency as large corporations. By adopting these solutions, entrepreneurs cease to act reactively and begin to manage their companies based on data, indicators, and strategic planning, which are the pillars of contemporary professionalization.

International experiences reinforce that the success of this process depends on integration between government, private initiative, and educational institutions. Models applied in the United States, Europe, and Latin American countries demonstrate that incentive policies, technical certifications, and democratic access to technology can transform a country's productive base.

Brazil has sufficient human capital, technical capacity, and economic potential to follow the same path, provided there is continuity, planning, and long-term vision. Therefore, the professionalization of small construction companies should be understood not as an isolated goal, but as a national development project.

It combines productivity, sustainability, inclusion, and innovation around a common purpose: to raise the quality standards of Brazilian construction and consolidate the sector as a strategic driver of progress.

More than just erecting buildings, professionalized companies build bridges between efficiency and dignity, between opportunity and citizenship. In short, the future of Brazilian construction will be determined by the ability of its small companies to reinvent themselves and by the country's willingness to support them on this journey.

Professionalization is the foundation on which a new, fairer, more competitive, and sustainable economic model will be built. And it is on this foundation that Brazil's economic and social development is truly built.

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