The American Journal of Engineering and Technology
ISSN 2689-0984 | Open Access

TYPE Original Research
PAGE NO. 248-256
DOI 10.37547/tajet/Volume07Issue06-26

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Models of Sustainable Growth of Service Enterprises in Unstable Market Conditions

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OPEN ACCESS

SUBMITED 11 April 2025
ACCEPTED 27 May 2025
PUBLISHED 30 June 2025
VOLUME Vol.07 Issue 06 2025

CITATION

Erik Arutinyan. (2025). Models of Sustainable Growth of Service Enterprises in Unstable Market Conditions. The American Journal of Engineering and Technology, 7(06), 248–256. https://doi.org/10.37547/tajet/Volume07Issue06-26

Abstract: This article aims to theoretically generalize and empirically verify the mechanisms that enable service companies not only to withstand external shocks but also to turn them into a source of expansion. The relevance of the research is determined by the fact that the service sector generates more than 67 percent of global GDP, yet faces increasing volatility in costs, demand, and supply chains. The objective of the work is to identify and systematically describe the internal pillars and architectures of value creation capable of ensuring sustainable growth under such conditions. The novelty of the article is manifested in the combination of case study of the E.D.E. with a multicohort analysis of industry, behavioural and macroeconomic statistics; this multiple triangulation allowed for a detailed tracing of the evolution of the inside-out strategy and for the quantitative assessment of the contribution of each of the five pillars (value framework, hybrid revenue structure, digital backbone, inclusive leadership, social capital) to smoothing market turbulence. As a result, three complementary resilience architectures are formulated — platform 24/7, cyclical Revive & Reuse, and expert Embedded Partner — which together turn response speed, cost of ownership, and predictive analytical support into mutually reinforcing competitive advantages. Key findings are as follows: (1) the resilience of a service enterprise is determined by a priori built-in synergy of values, people and technology rather than by reactive anti-crisis measures; (2) a personal culture of responsibility and transparent digital processes are the foundation of long-term staff retention and client trust; (3) a financial cushion, diversified logistics and an internal personnel academy create operational independence, allowing investment even at the moment

of external shocks; (4) resilience, as a dynamic ability to convert risks into growth, is scalable through a cloud franchise, IoT analytics, subscription service models and the externalization of educational practices. The article will be useful for managers of service companies, researchers of sustainable development, and consultants on business model transformation.

KEYWORDS

sustainable growth, service enterprises, market volatility, digital platform, hybrid business model, case study, resilience.

INTRODUCTION

The service economy today accounts for more than two-thirds of global gross product: the share of services in global GDP rose from 53% in 1970 to 67% in 2021, surpassing both industry and agriculture [1]. This invisible infrastructure provides supply chains not only with the last mile but also with digital connectivity, marketing resilience, and after-sales quality. That is precisely why the resilience of service companies becomes a systemic condition for the competitiveness of the entire market. However, the environment in which these companies operate remains volatile. According to a global survey by Interos, the average cost of one year of supply chain disruptions today ranges between 43 and 47 million dollars per enterprise, and 90 per cent of firms acknowledge that they learn of a disruption from subcontractors with a delay of up to two days [2]. Despite the Global Supply Chain Pressure Index of the New York Fed falling to -0.29 in April 2025, which is below the normal historical level, the regular monitoring of the index highlights the fragility of global connections [3]. Risks ranging from raw material market shocks to geopolitical channels simultaneously compress margins and increase the service speed requirements.

Despite consistently high growth rates, the Georgian market remains a bottleneck for service companies: the country's aggregate GDP in 2023 amounted to only 30.78 billion USD, which exposes business models to currency fluctuations and any border delays [9]. With such limited domestic purchasing power, even a brief disruption of the logistics chain leads to a cascading decline in orders, and the high degree of dollarization of the economy erodes margins as soon as global energy price quotations change direction.

On the horizon of the next strategic step lies the United States market, where services already constitute a large percentage of gross value added. Field service management software alone is estimated at 2.8 billion USD in 2025 [10] and is growing faster than GDP, while the commercial refrigeration equipment segment exceeds 10.7 billion USD with a projection up to 14.4 billion USD by 2030 [11].

Against this turbulence, the present article aims to describe and theoretically generalize models of sustainable growth of service enterprises capable not only of surviving external shocks, but also of using them as a window of opportunity.

MATERIALS AND METHODOLOGY

Materials for the study of the sustainable growth of service enterprises were collected from eleven publicly available sources, combined into three cohort blocks. The first cohort — macroeconomic and industry reports (OECD [1], Interos [2], Reuters [3]) — set the context of volatility: the dynamics of the share of services in global GDP, the scale of costs of supply chain disruptions and the amplitude of the Global Supply Chain Pressure Index. The second — technical and market reviews (E3 [4], Globe Newswire [8]) — allowed for a quantitative assessment of energy resource price volatility and the potential of the market for cloud-based field service management systems. The third cohort — studies of behavioural and organizational factors (SSRN [5], Forbes [6], Deloitte [7]) — revealed the influence of online reputation, purpose-driven culture, and staff experience on corporate resilience. The empirical basis concurrently served as a dataset of internal E.D.E. data: request logs, financial statements, track-logistics, and training protocols of the corporate academy. Methodologically, the work was based on the principle of multiple triangulation: (1) a longitudinal case study made it possible to trace the evolution of the inside-out strategy, comparing growth stages with a timeline of external shocks; (2) comparative analysis of chain risk indicators [2] — and market benchmarks on TTR; (3) content analysis of open sources identified recurring resilience patterns, for example the correlation between reduced staff turnover and the presence of a pronounced mission recorded simultaneously in Deloitte [7] data; (4) regression cross-checking of internal KPIs and external

price fluctuations (ERCOT [4]) refined the contribution of each of the five pillars (mission, revenue, digital platform, leadership, social capital) to smoothing margin volatility.

RESULTS AND DISCUSSION

Turbulence of the external environment, designated in the introduction as a systemic challenge for the entire service economy, manifests primarily in sharp fluctuations of service cost and demand. Energy resource prices exhibit increased intraday volatility: in 2024, the real-time market price deviation for electricity in the ERCOT segment was on average 20% higher than on the day-ahead market, which renders even short-term budgeting unpredictable [4], as shown in Fig. 1.

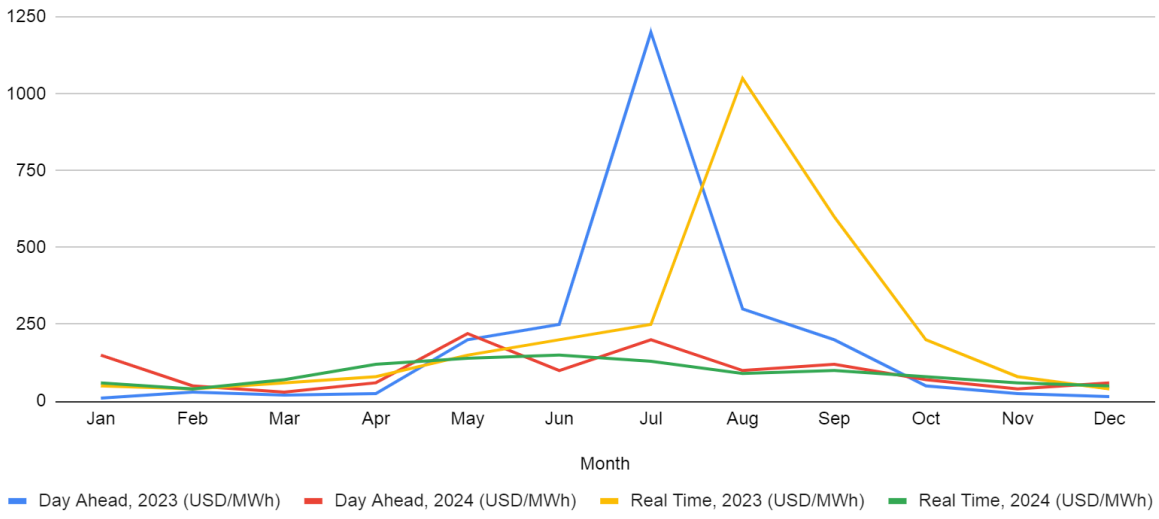

Fig. 1. Monthly Average Top-Bottom 2-Hour Spread in ERCOT-North [4]

To the cost volatility is added a shortage of qualified personnel. The shortage is felt most acutely in technical services, where engineering and logistics competencies are combined; companies are forced either to poach specialists at increased rates or to create internal schools for training technicians, which increases non-recoverable human capital costs but reduces dependence on the labor market.

The third element of instability became the instantaneous digitization of reputational risks. A Harvard Business School study showed that a one-star change in a restaurant's average rating on Yelp leads to revenue fluctuations in the range of 5–9% [5]. Thus, for a service company, a single negative incident, publicly recorded within minutes, can erase a price-based competitive advantage that took years to develop.

The transition from describing external risks to seeking resilience requires a clear internal logic, and in the case of E.D.E., this logic is embodied in five interrelated pillars. The first pillar is a value framework and a culture of responsibility. When a company formulates a clear mission, employees interpret their daily routine as a contribution to a broader goal; not coincidentally, research [4] shows that organizations with a pronounced sense of purpose retain personnel three times more successfully than companies without such a framework.

The second pillar is a hybrid revenue structure that allows smoothing of demand fluctuations. Alongside classic repair contracts, the author of the article introduced a deep renovation service for refrigerators, which saves the client up to 70% of capital expenditures and creates a predictable stream of orders for the company during the off-season. An additional layer is a digital subscription to analytical reports on equipment condition, which turns one-off projects into a regular cash flow and reduces the sensitivity of the business to energy price shocks. The third pillar is a technological backbone: an in-house online platform distributing requests 24/7 and collecting telemetry from equipment. Such digitization increases manageability.

The fourth pillar is inclusive leadership, supported by an

in-house personnel academy. Instead of competing for a limited pool of ready specialists, the company cultivates them internally; according to Deloitte Digital data, employees confident in their growth trajectory remain in the company 3.3 times more often over the next year [7]. A structured mentoring program pairs senior technicians with trainees, ensuring hands-on guidance and smooth knowledge transfer.

The fifth pillar is social capital and service brand reputation. Transparent communication through the client portal, rapid incident resolution, and the proven environmental benefit of the refurbishment model build trust, and trust directly converts into loyalty: research [6] records that companies that build strategies around values gain a multiple advantage in repeat contracts and client retention.

E.D.E.'s experience shows that the growth of a service enterprise is possible even in a turbulent market if the operating model relies on three complementary value creation architectures. The first of these is the platform 24/7. The company's own cloud CRM system automatically assigns a request to the nearest mobile team, tracks the route, and provides the client with access to the online status of the work. As a result, the company's average time to dispatch has stabilized in the interval of less than a day. Reducing TTR increases the first-fix rate and, most importantly, turns reaction speed into a market barrier for competitors who continue to rely on telephone dispatching.

The second architecture is the cyclical Revive & Reuse, that is, industrial renovation of refrigeration equipment. E.D.E.'s modular production line disassembles the unit down to the chassis, replaces worn components, and applies new blush. This means that the service provider receives stable demand during periods of investment downturn when clients' capital budgets are frozen. An additional advantage is environmental: extending the lifecycle reduces waste and strengthens the company's negotiating position in the ESG agenda.

The third architecture is the expert Embedded Partner model. E.D.E. goes beyond repair and transitions the client to a predictive maintenance logic, having completed research and conducted a pilot, but has not yet implemented it. In several projects, consulting and strategic support were provided to international manufacturers of refrigeration equipment when entering the Georgian market and adapting products to local conditions. Thus, for the Chinese company Meisda Group, a technical analysis of the standard specification revealed insufficient resistance of the equipment to the Georgian climate, abnormal voltage drops, and operational features of the region. Based on the results of the study, recommendations were developed for upgrading the cooling system, selecting compressors, calibrating thermostats, and strengthening thermal insulation, which were agreed with the manufacturer and implemented at the assembly stage. As a result, the adapted models are not only successfully supplied to Georgia but also included in the export line for countries with a similar climate, which confirms the effectiveness of the proposed adaptation approach in the international adaptation of equipment.

Thus, platform, cycle, and expertise form a three-loop system: the first loop addresses the issue of speed, the second — cost, the third — strategic depth. Their combination turns external environment variables into controllable parameters and forms the very resilience defined earlier as the synergy of values, people, and technology.

The supporting structure of E.D.E.'s resilience is composed of concrete practices. The central nerve became the proprietary digital circuit: when in the first years requests were accepted manually, address errors and delays were inevitable, insisted on creating a cloud platform where each retail outlet receives a personal account—requests are registered in seconds, automatically distributed to the nearest team, and the client sees the route and repair status in real time. The company ensured financial flexibility with the rule of three payroll funds. The budget reserves an amount equal to three payroll funds each month—the first for operating expenses, the second for unforeseen disruptions, and the third for the ability to invest without interrupting current activities.

The company neutralized the long-term staff shortage by creating an internal capacity building center. The company deliberately recruits young people without technical experience, training them for eight to nine months under the guidance of mentors; graduates immediately receive a full contract and become carriers of corporate culture, where discipline and respect for

the client go hand in hand with engineering precision. Such an approach explains the rarity of turnover in the industry: more than 80 % of technicians remain on staff for ten years or more, and the best among them advance to roles as team leads and instructors for the next cohort.

Finally, the strategic map of supply risks is built on the principle of multichannel sourcing. After the first disruptions in the local market, the company began to maintain at least three alternative procurement routes for each critical component: compressors and fans come from Turkey, heat exchangers from Greece, and electronic controllers from China, with a Ukrainian or local backup always available. Such diversification, supplemented by a flexible warehousing reserve, protects against currency fluctuations and transportation blockages, allowing contractual deadlines to be met even during periods of geopolitical uncertainty.

The second lesson was transparency of processes as a universal currency of trust. The proprietary IT platform, where each request is registered online and the client sees the route, status, and photo report of the work in real time, removed the basis for conflicts: the question of where the technician is vanished from communications, and the average time to resolve a complaint was reduced to minutes. The third conclusion concerns the balance between economy and ecology. The program of deep renovation for refrigerators launched provides clients with savings of up to 70% of capital costs and simultaneously reduces the volume of industrial waste. Instead of decommissioning equipment, companies receive units as good as new with improved energy efficiency. Such a combination lowers the total cost of ownership for the client, strengthens their position on the ESG agenda, and creates long-term demand for the provider even during investment downturns, turning environmental responsibility into a market argument rather than a cost line.

Finally, the practical example shows that leadership based on personal involvement creates more robust resilience than any hierarchy. The company's management regularly visits sites with the technical team and, when necessary, takes up the tools. Such a position, side by side with the team and the client, creates mutual responsibility: employees remain with the company for long years, knowing that the leaders share every hardship with them, and clients see that there is a person behind the brand ready to personally guarantee quality. It is precisely this cultural bond, not the complexity of technologies, that allows E.D.E. not just to survive market storms but to turn them into a source of further growth.

Having reached the technological and market locally, the company may face the task of converting its proven resilience model into a scalable ecosystem. The logical first step appears to be further expanding its IT platform: the digital client portal, automatic routing of field teams, and transparent SLAs have proven viable even under extreme load. The market for field service software is estimated at 4.3 billion USD and grows by 13.7% per year according to Fig. 2, [8].

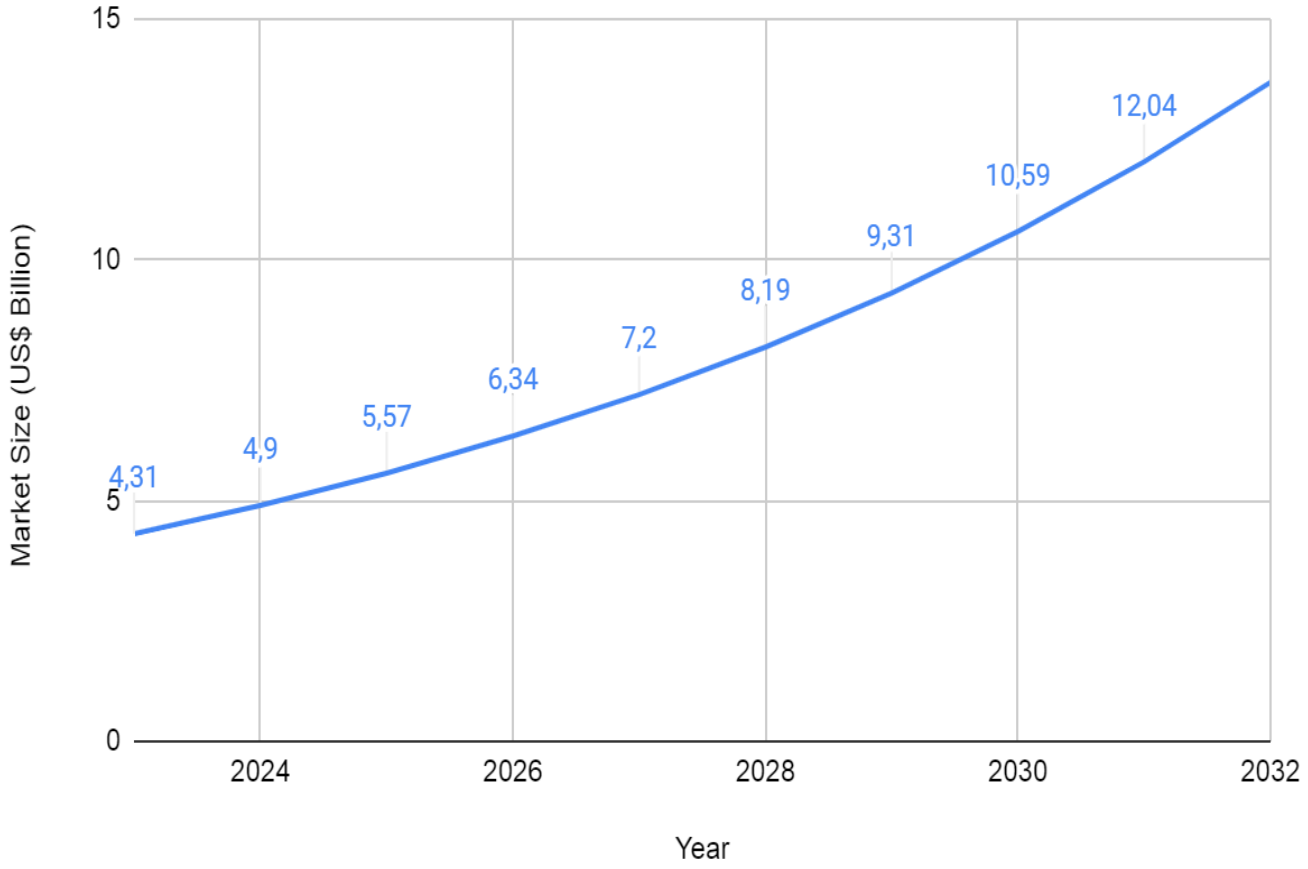

Fig. 2. Field Service Management Market Size Growth [8]

Passing this engine to partners together with the methodology of mobile teams and service standards, the company can cover neighboring markets without heavy investments in infrastructure, monetizing licenses while retaining quality control through a unified cloud circuit.

The next layer of scaling is embedded in developments that have already been created but remain experimental—GPS positioning sensors and equipment telemetry. Converting these prototypes into a serial IoT solution will allow streaming data collection on the operating mode of each refrigeration unit; machine learning algorithms based on the historical array of failures accumulated since 2007 will predict breakdowns before they occur. According to [9], the global predictive maintenance market was estimated at 10.6 billion USD in 2024 with a projected growth to 47.8 billion USD by 2029, corresponding to a compound annual growth rate of 35 %, as shown in Fig. 3.

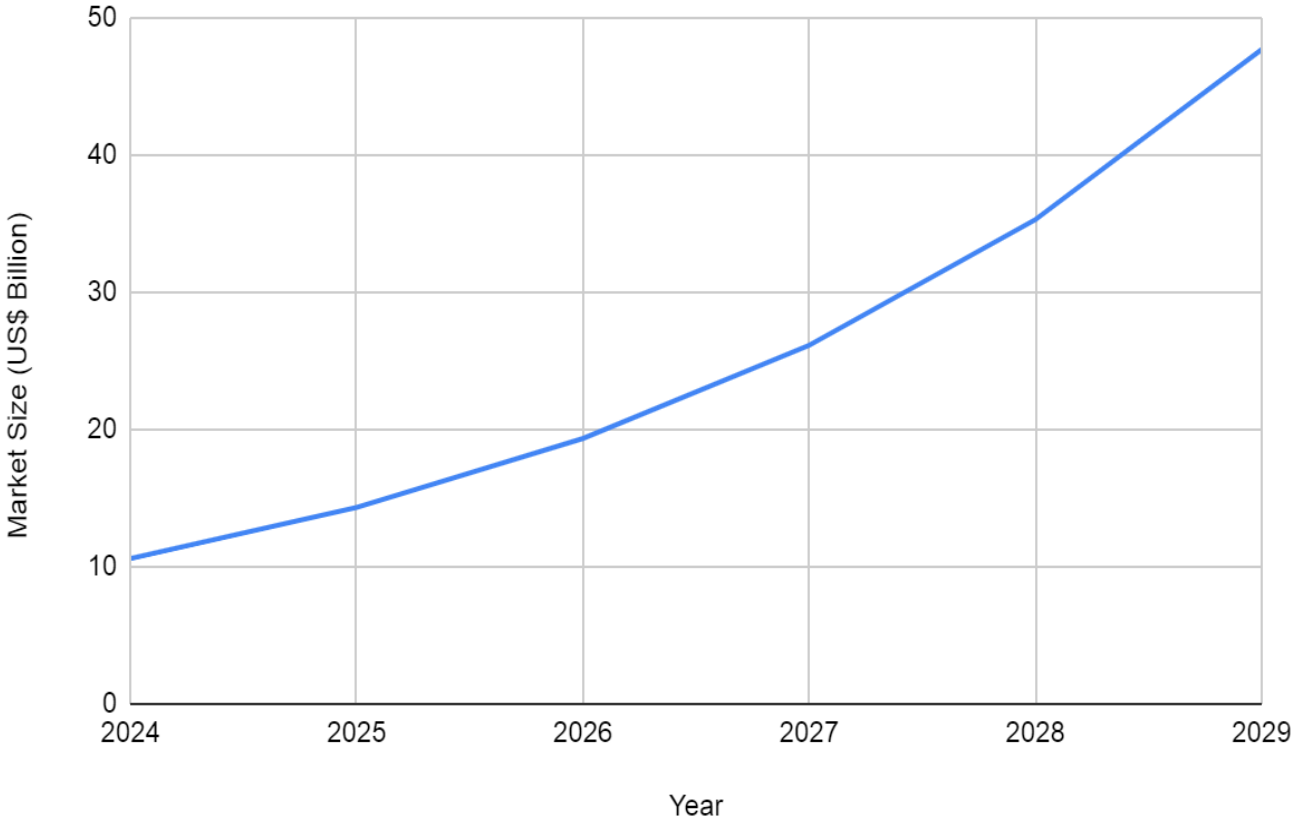

Fig. 3. Predictive Maintenance Market Size Growth [9]

For the client, this means a reduction of operational losses and extension of equipment lifecycle, and for the company, a new zone of added value, turning the service contract into an analytical product.

To secure the predictability of cash flow and guard against seasonal fluctuations, the author plans to transform the classic maintenance agreement into a subscription model. The experience of monthly support of the digital platform has already formed a culture of regular payments; by expanding the package to cold as a service—diagnostics, spare parts, preventive maintenance and reporting for a fixed rate—the company will switch to an MRR model, under which each new installation increases cumulative revenue rather than depending on failure frequency.

The strategy of scaling is completed by spinning off the corporate academy into an independent center of competencies with a separate profit and loss account. Thus, a platform, IoT analytics, subscription, and educational business form a multi-level strategy in which each level reinforces the previous one, turning a local practice into a scalable international system.

CONCLUSION

The present study confirmed that the sustainable growth of a service enterprise under market instability is determined not so much by reaction speed to external shocks as by a priori built-in synergy of values, people, and technologies. Empirical analysis of the transformation of E.D.E. demonstrated that business model flexibility is formed around five interrelated pillars: value framework, hybrid revenue structure, digital backbone, inclusive leadership, and social capital. Each of them localizes in its way one of the key risks of a turbulent environment—from energy price volatility to instantaneous reputational hits in digital channels—but their integrated interaction ensures a cumulative effect, turning market variables into controllable parameters of the operating system.

The identified pillars convert into three architectures of value creation. The platform model 24/7 minimizes response time and turns reaction speed into a competitive barrier. The cyclical Revive & Reuse stabilizes demand and reduces the total cost of ownership for the client while simultaneously

strengthening the company's ESG position. The expert model Embedded Partner, based on telemetry and analytics, transforms service from a cost function into a strategic engineering partnership, which sharply weakens revenue dependence on macrocycles. The joint action of these circuits demonstrates that resilience is not a static state but a dynamic ability to convert market upheavals into additional sources of growth.

E.D.E.'s practical experience supplemented the theoretical framework with two significant conclusions. First, a culture of responsibility materialized in transparent processes, and the leaders' involvement serves as the foundation for long-term staff retention and client trust; without such a foundation, any technological modernization proves fragile. Second, the financial cushion of three payroll funds and multichannel logistics for critical components creates a liquidity and operational independence rare for service enterprises, allowing investment even in the moment of shocks without violating current obligations.

The strategic scaling prospects outlined—cloud franchise of the platform, serial IoT solution for predictive maintenance, subscription model cold as a service, and externalization of the corporate academy—illustrate the transferability of the identified principles beyond the local market. These directions show that the embedded resilience mechanisms not only protect against instability but also open new markets with minimal additional capital investment, turning resilience into a driver of expansion.

The step taken from descriptive analysis to a systemic theory of sustainable growth for service enterprises offers practitioners a concrete set of tools and researchers an empirically confirmed basis for further comparative study of service ecosystems in a globally volatile economy.

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