

Flexibilization of Annual Operational Planning in Crisis Contexts: A Conceptual Model Proposal for Ecuadorian SMEs

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Abstract. The Annual Operational Planning (POA) is a key tool for organizational management; however, its rigidity limits its effectiveness in crisis contexts characterized by high uncertainty. This article analyzes strategies to make POA more flexible and to strengthen the adaptive capacity of small and medium-sized enterprises (SMEs) in Ecuador. Through a systematic literature review and the analysis of best practices, six key strategies are identified: dynamic strategic diagnosis, prioritization of critical objectives, scenario-based planning, adaptive key performance indicators (KPIs), resource optimization, and adaptive organizational culture. As a result, a conceptual model is proposed, integrating these strategies in a structured and progressive way, tailored to the operational realities of SMEs in the country. Although the proposal is based on theoretical evidence, the absence of empirical validation is recognized as a limitation; therefore, pilot applications in different productive sectors are recommended. The model aims to serve as a practical tool to guide operational planning in complex and volatile environments.

Keywords: Annual Operational Planning, Adaptive strategies, Business crisis, SMEs in Ecuador, Organizational flexibility.

Resumen. La Planificación Operativa Anual (POA) constituye una herramienta clave para la gestión organizacional; sin embargo, su rigidez limita su efectividad en contextos de crisis caracterizados por alta incertidumbre. Este artículo analiza estrategias para flexibilizar la POA y fortalecer la capacidad de adaptación de las pequeñas y medianas empresas (PYMES) ecuatorianas. A través de una revisión sistemática de literatura y el análisis de buenas prácticas, se identifican seis estrategias clave: diagnóstico estratégico dinámico, priorización de objetivos críticos, planificación basada en escenarios, indicadores clave de desempeño (KPIs) adaptativos, optimización de recursos y cultura organizacional adaptativa. Como resultado, se propone un modelo conceptual que integra estas estrategias de forma estructurada y progresiva, adaptado a las realidades operativas de las PYMES del país. Aunque la propuesta se fundamenta en evidencia teórica, se reconoce como limitación la ausencia de validación empírica, por lo que se recomienda su aplicación piloto en distintos sectores productivos. El modelo busca convertirse en una herramienta práctica para orientar la planificación operativa en entornos complejos y volátiles.

Palabras claves: Planificación Operativa Anual, Estrategias adaptativas, Crisis empresarial, Pymes en Ecuador, Flexibilidad organizacional.

1. INTRODUCTION

Annual operational planning (AOP) is a fundamental tool for organizations to establish clear goals, allocate resources efficiently, and design strategies that allow them to achieve their objectives. However, in a global scenario characterized by recurring crises, such as the COVID-19 pandemic, financial instability, and geopolitical conflicts, the traditional annual planning model has proven inadequate (J. e. a. Madariaga, 2020). These critical situations, combined with phenomena such as climate change and the accelerated process of digitalization, have generated environments marked by high uncertainty. In such contexts, rigid AOP approaches quickly lose their validity, requiring organizations to be more adaptable in their planning strategies.

In Latin America, this problem is exacerbated by the region's unique economic and political vulnerabilities, which significantly affect organizations' ability to plan and react effectively to crises (N. M. Quiñones Huayna, 2023). Factors such as a high dependence on exports, frequent changes in government policies, and fluctuations in labor and financial markets pose unique challenges for businesses and institutions (J. Marchini, 2024). Many organizations lack the resources and adequate structure to implement agile planning, resulting in strategies that fail to effectively address the complexities of the environment.

In Ecuador, this situation is exacerbated by local specificities, such as dependence on primary sectors, a dollarized economy, and the impact of public debt. Ecuadorian companies, especially small and medium-sized enterprises (SMEs), often adopt rigid planning approaches that limit their ability to respond quickly to unexpected events, such as economic or political crises (Mendieta-Bejana & Mendoza-Saltos, 2024). This lack of flexibility affects both the financial stability and sustainable development of these organizations, hampering their ability to adapt in a dynamic and challenging environment.

In this context, this article aims to identify strategies aimed at making Annual Operational Planning (AOP) more flexible in crisis contexts, by presenting a proposal for a conceptual model adapted to the conditions of Ecuadorian SMEs, which contributes to strengthening their adaptability and organizational sustainability.

2. STATE OF THE ART

2.1. Economic and Organizational Context in Latin America and Ecuador in Times of Crisis

In recent years, Ecuador has faced a series of economic and social challenges that have profoundly impacted its business environment, influencing how organizations manage their Annual Operating Planning (AOP). Factors such as oil price fluctuations, dollarization, external debt, and a heavy dependence on primary sectors have increased the country's economic vulnerability. These conditions, exacerbated by global crises such as the COVID-19 pandemic and domestic political uncertainties, have limited companies' ability to develop long-term planning, as the volatile environment directly affects their financial and operational stability (Useche-Aguirre, 2021). In particular, small and medium-sized enterprises (SMEs) face greater difficulties due to a lack of financial and technological resources, as well as a limited organizational infrastructure that prevents them from adapting quickly to uncertain environments, unlike large companies that, with greater flexibility, can adjust their strategic plans (Rodríguez, 2024) (Palas Villagómez and V. E. Salcedo-Muñoz, 2022).

The literature review shows that organizations that implement flexible and adaptive approaches in their AOPs achieve significant benefits by responding more effectively to crises and uncertainties. Data shows that in 2020, 70% of companies globally used a traditional AOP approach, while only 30% employed adaptive strategies, as shown in Figure 1. By 2021, this trend improved slightly, with 40% of companies adopting flexible models. During the COVID-19 pandemic, companies that implemented adaptive AOPs achieved a survival rate of 85%, compared to 50% for those with traditional approaches, demonstrating that flexible planning enables a faster and more effective response to external changes.

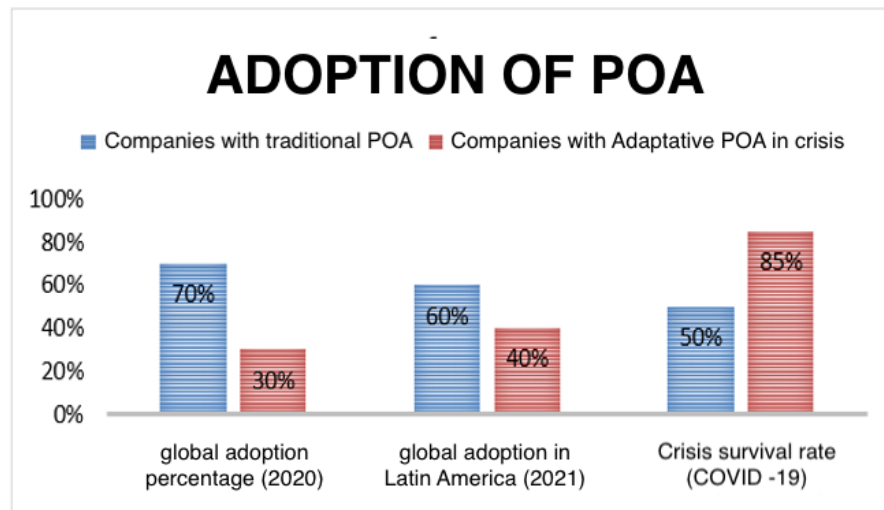


Figure 1. Use of rigid vs flexible POA by periods.

2.2. Annual Operational Planning (AOP)

Annual Operational Planning (AOP) is the process by which an organization establishes annual objectives and defines the strategies, resources, and activities necessary to achieve them (Murillo R, 2024). In stable environments, this process is characterized by its predictable structure. However, in crisis situations, AOP must be transformed into a flexible and adaptive mechanism that allows for rapid adjustments without compromising organizational objectives. Authors such as (Mohamad, et al., 2013) emphasize the need to organize crisis management systems in institutions, including annual operational planning, to improve preparedness for unpredictable events. It advocates the creation of executive manuals and instructions tailored to the unique characteristics of each organization as an effective response to crises, while (Juan. A., et al, 2020) suggest that annual operational planning should be adapted to crisis situations by developing integrated planning tools, utilizing simulation to estimate needs, and allowing for real-time modifications based on updated data to manage resources effectively during crises. Finally, (Faghih, Ah., et al, 2016) emphasize that comprehensive preparedness plans, including annual operational planning, are essential for organizations to respond effectively to crises, minimizing delays and confusion while improving decision-making and overall response effectiveness during disasters.

3. METODOLOGY

This study adopts a qualitative integrative review approach, aimed at identifying effective strategies to make Annual Operating Planning (AOP) more flexible in crisis contexts, with an emphasis on the Ecuadorian environment (Villa Andrade et al., 2024). A systematic literature review was used as a research method, aligned with the guidelines of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model adapted to management and administration studies, which are composed of the following phases:

Phases of the review

Definition of the research question: ¿What strategies allow for making the POA more flexible in contexts of high uncertainty, especially in Ecuadorian SMEs?

Search for sources

- A systematic search was conducted in academic databases such as Scopus, Google Scholar, Redalyc and SciELO.
- Keywords used (in English and Spanish): Annual Operational Planning, adaptive strategies, crisis management, organizational flexibility, adaptive planning, operational flexibility, crisis management.

Inclusion and exclusion criteria

Inclusion:

- Publications between 2019 and 2024
- Studies in Spanish and English
- Peer-reviewed articles
- Research applied to companies, SMEs, public or private institutions

Exclusion:

- Documents without full access
- Essays without a solid empirical or theoretical basis
- Publications focused exclusively on unrelated sectors (such as health or education, if they did not apply planning tools)

Selection process

An initial 243 studies were identified, of which 85 met the inclusion criteria after reviewing titles and abstracts (see Figure 2).

Finally, 43 documents were selected for detailed analysis, including scientific articles, case studies, technical reports, and guides from international organizations (such as the World Bank, 2024, and ECLAC, 2016).

Synthesis and analysis

Thematic coding was used to classify the strategies found into common categories (diagnosis, scenarios, KPIs, etc.).

Traditional and adaptive approaches were compared, and their applicability in the Ecuadorian context was examined.

The information was organized into comparative matrices, and recurring patterns, barriers, and recommendations were derived.

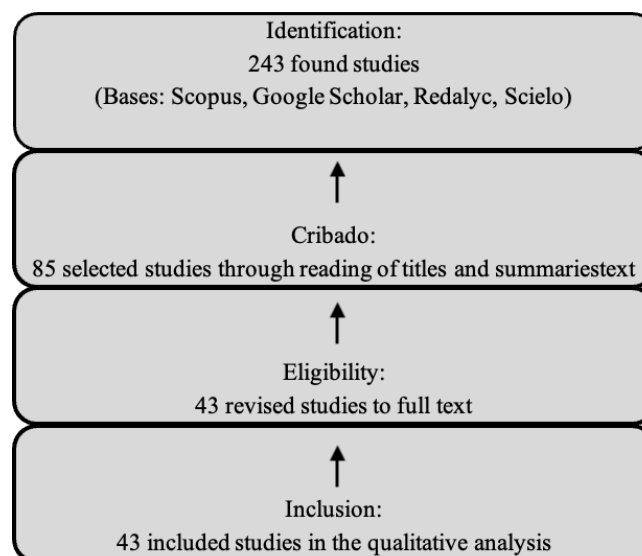


Figure 2. Methodology Process adapted to PRISMA model.

4. RESULTS AND DISCUSSION

The analysis of literature and best practices identified a set of key strategies for making the AOP more flexible, aimed at strengthening organizations' adaptive capacity in uncertain scenarios. These strategies, particularly applicable to the Ecuadorian context, include specific tools, approaches, and actions to improve organizational resilience.

a) Diagnostic and environmental analysis strategies

Environmental diagnosis and analysis are essential for making data-driven strategic decisions. According to Voronkova (2021) and Parrales et al. (2024), this process includes:

- **Internal and external analysis:** Using tools such as PESTEL to evaluate political, economic, social, technological, ecological and legal factors that impact the operation, identifying risks and opportunities.
- **Continuous monitoring:** Implementation of surveillance systems that detect external changes, such as fluctuations in export prices, political dynamics, or new consumer trends (Daniel & O'Leary, 2020).

These strategies allow organizations to anticipate changes and respond effectively in a dynamic environment.

b) Prioritization of critical objectives

In crisis contexts, prioritizing critical objectives is essential for the survival and stability of businesses. Waruwu et al. (2024) highlight the importance of focusing resources on strategic areas, such as:

- Maintain positive cash flow.
- Protect relationships with key customers.
- Ensure the continuity of critical operations.

This approach ensures resource optimization and business resilience in the face of significant challenges.

c) Scenario-based planning

Scenario-based planning is a key strategy for managing uncertainty and ensuring flexibility in decision-making. According to Gogol et al. (2019), this methodology allows plans to be designed considering three perspectives:

- **Optimistic:** Focused on moderate expansion.
- **Intermediate:** Oriented towards the balance between growth and savings.
- **Pessimistic:** Prioritizing cost reduction and strengthening essential areas.

This approach ensures that organizations can adapt to different future contexts, maximizing their responsiveness to changes in the environment.

d) Definition and integration of adaptive KPIs

The implementation of adaptive key performance indicators (KPIs) is essential for flexible and effective management. According to Setiawan et al. (2020) and Angeli (2022), these indicators allow monitoring and evaluation to be tailored to the context, ensuring better decisions. Some of the key KPIs include:

- Available cash flow.
- Inventory levels.
- Staff turnover.
- Customer satisfaction.

By integrating adaptive KPIs, organizations achieve a clear and accurate view of their performance, facilitating a proactive response to changing environmental dynamics.

e) Optimization of financial and operational resources

Resource optimization is essential to ensure efficiency and sustainability, especially in contexts of uncertainty. According to Jidras (2023), companies can implement specific strategies to improve their financial and operational management, such as:

- **Expense classification:** Identify and differentiate between essential, useful, and postponable expenses to prioritize the use of resources.
- **Emergency fund:** Allocate a percentage of the budget to contingencies, ensuring liquidity in unforeseen situations.
- **Contract renegotiation and automation:** Reduce operating costs by reviewing strategic agreements and adopting technologies that drive efficiency.

These actions allow for maximizing the use of available resources, strengthening the capacity to respond to financial and operational challenges.

f) Training and cultural change

Training and cultural transformation are pillars for an organization prepared for uncertainty. According to Muddassar Sarfraz (2024), it is essential:

- **Foster an adaptive organizational culture:** Promote values that drive flexibility and proactive risk management, enabling the organization to respond effectively to changes.
- **Train staff:** Provide training in decision-making under uncertainty and in the use of monitoring tools, strengthening the skills necessary to identify and address risks in a timely manner.

These strategies ensure that both staff and the organization are aligned to meet dynamic challenges with greater effectiveness and confidence (see Figure 3).

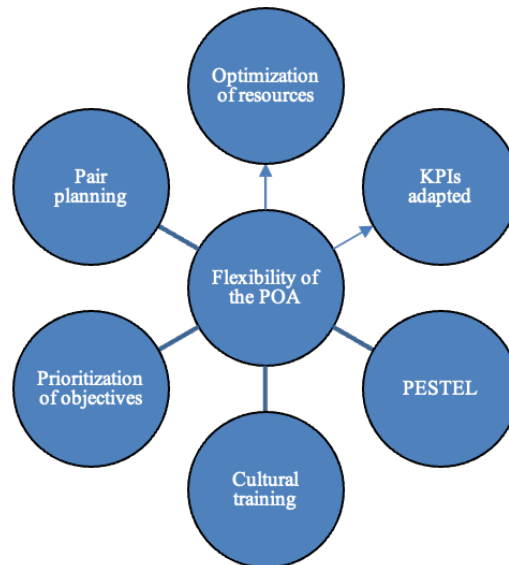


Figure 3. Strategy diagram for flexible POA.

As can be seen, the research reinforces the importance of transforming Annual Operating Planning (AOP) into a flexible and adaptive mechanism, especially in contexts characterized by high uncertainty, such as Ecuador's. While traditional approaches have worked in stable scenarios, their rigidity renders them obsolete in the face of unexpected crises. In contrast, the adaptive strategies analyzed here demonstrate a greater capacity to minimize risks and optimize resources.

However, their effective applicability in Ecuador depends on several key factors. The use of tools such as PESTEL analysis or adaptive KPIs requires trained personnel and systematized internal processes, which represents a significant barrier in many Ecuadorian SMEs, where informal structures predominate. In this regard, it is suggested to adopt simplified and progressive versions of these tools, as also pointed out by Tuğberk and Akbalik (2019). Furthermore, scenario-based planning, although theoretically robust, requires analytical skills that are often not developed in the management teams of small companies. Therefore, it is advisable to promote alliances with universities or training centers to develop adapted technical capabilities, as proposed by Espen et al. (2022).

The viability of each strategy, therefore, cannot be evaluated in the abstract, but must be analyzed based on the company's size, its productive sector, and its level of organizational maturity. From this perspective, the added value

of this study lies in offering an adaptable conceptual model focused on the Ecuadorian context, which can be applied by public institutions, chambers of commerce, or business consultants. This approach is consistent with the proposals of Harald (2022), who argues that contextual operational flexibility is fundamental to sustainability.

As a result, a conceptual model is presented for the flexibility of Annual Operational Planning (AOP) in Ecuadorian SMEs, structured around six pillars: environmental diagnosis, strategic prioritization, scenario planning, adaptive KPIs, resource optimization, and adaptive organizational culture. This framework can constitute a solid foundation for future applied research or case studies. However, the lack of empirical validation represents a recognized limitation. Consequently, field studies are recommended as a future line of research to measure the real effectiveness of these strategies in different productive sectors, as suggested by Mussó (2023) and Villagra & Pandolfi (2023).



Figure 4. Flexible POA conceptual model for Ecuadorian SMEs.

Figure 4 represents the conceptual model designed to guide Ecuadorian SMEs in adopting a more flexible and resilient Annual Operating Plan (AOP). This model is structured sequentially, beginning with the dynamic strategic assessment, a phase that allows for an understanding of both the organization's internal and external environment. Through tools such as PESTEL and SWOT analysis, companies can identify risks, opportunities, and critical factors that influence their performance, which is especially relevant in a volatile economic environment such as Ecuador's. Based on this, the prioritization of critical objectives is developed, a stage in which the most relevant objectives for operational sustainability are prioritized, such as cash flow protection, the continuity of key activities, or the loyalty of strategic customers. This prioritization enables a more efficient allocation of available resources. This is followed by the implementation of scenario-based planning, a tool that allows companies to anticipate possible changes in the environment by formulating alternative plans based on optimistic, intermediate, or pessimistic scenarios. This methodology strengthens the company's ability to react and reduces vulnerability to unexpected events.

Based on these definitions, adaptive KPIs are integrated—key performance indicators that are adaptable to the environment—that allow for real-time monitoring of progress, detecting deviations, and redirecting actions as needed. This feedback is essential for making informed and timely decisions. The next component, resource optimization, seeks to maximize operational efficiency through actions such as expense classification, process automation, and contract renegotiation. In contexts where resources are scarce, as is often the case in Ecuadorian SMEs, this stage is crucial to ensuring continuity. Finally, the model is consolidated with the development of an adaptive organizational culture, which acts as a cross-cutting axis of the process. It involves promoting flexible leadership, strengthening staff competencies, and fostering an open mindset toward change. Without this cultural foundation, the previous strategies run the risk of being unsustainable over time. Overall, this model offers a progressive, practical, and contextualized roadmap for implementing a flexible AOP that addresses the current challenges facing SMEs in Ecuador.

CONCLUSIONS

This research has demonstrated that, in contexts marked by high uncertainty, such as Ecuador's, the flexibility of Annual Operating Planning (AOP) is a key strategy for improving the resilience and sustainability of small and medium-sized enterprises. Based on a systematic review and critical analysis of relevant literature, six fundamental strategies were identified and organized into an adaptable and progressive conceptual model. This model, designed specifically for Ecuadorian SMEs, integrates components such as dynamic strategic diagnosis, prioritization of critical objectives, scenario planning, the use of adaptive KPIs, resource optimization, and the strengthening of a flexible organizational culture. Its structure allows for its stepwise and contextualized application, based on the capabilities and conditions of each organization.

However, a recognized limitation of the study is the lack of empirical validation of the proposed model. Although its construction is based on theoretical evidence and documented good practices, it has not yet been applied in real-life companies in Ecuador. Therefore, future studies are recommended to validate this model through field research, case studies, and pilot applications in various productive sectors in the country. Implementing these strategies under real-life conditions will not only allow for evaluating their effectiveness, but also provide feedback and strengthen the model, providing concrete evidence that facilitates its adoption as a practical tool for the flexible operational management of Ecuadorian SMEs.

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Declaration of Conflicting Interests

The authors of the article entitled "POA in Times of Crisis: How to Adapt Your Annual Planning to an Uncertain Environment" declare that they have no conflicts of interest that could have influenced the conduct of the research, the writing of the manuscript, or its publication in the journal Engineering and Applied Sciences in Industry (EASI).

We also confirm that there are no financial, commercial, or personal relationships that could be perceived as influencing the results or interpretations presented in this work.

We also confirm that the publication of this article in no way affects the interests of third parties and that all content presented is original and supported by reputable and verifiable sources.

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