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CASE STUDY

A proposal of a systematic approach to support the correctional activity of the Brazilian Federal Police

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ABSTRACT

Goal: This article proposes a systematic approach to support correctional activity of the Brazilian Federal Police, using the Plan-Do-Check-Act (PDCA) cycle and quality management tools to analyze, prioritize, and prevent the recurrence of nonconformities in investigative processes.

Design/Methodology/Approach: A case study was conducted, of an applied nature and with a qualitative–quantitative approach, based on administrative records of the Brazilian Federal Police in the State of São Paulo (Brazil). Data were obtained from Business Intelligence systems used in summary inspections and from reports of ordinary inspections. The proposed system is structured around the PDCA cycle, supported by the Pareto, Ishikawa, Failure Mode and Effects Analysis (FMEA), and 5W1H (What, Why, Where, When, Who, and How).

Results: The results indicate that the proposed approach has the potential to strengthen internal control by increasing process traceability and supporting the prioritization of nonconformities associated with critical deadlines of police investigations, such as delays in dispatching, case file movement, and long-duration police inquiries. The system can support data-driven decision-making in contexts of workload overload and systemic limitations.

Limitations of the investigation: The limitations are concentrated on the high level of engagement required from personnel and on absence of empirical validation over time, given the prospective nature of the application.

Practical implications: The study offers a model applicable to correctional management, capable of supporting public managers in the standardization and monitoring of investigative processes.

Originality/Value: The study is distinguished by the structured integration of the PDCA cycle with quality management tools applied to correctional activities.

Keywords: Correctional activity; Continuous improvement; PDCA; Quality management; Brazilian Federal Police.

1 INTRODUCTION

Correctional oversight bodies operate in the promotion and protection of human rights through the inspection of environments of deprivation of liberty that, by their nature, remain at the margins of public visibility. Several international human rights treaties and conventions impose on States the responsibility to establish independent mechanisms for monitoring and controlling conditions and fundamental rights (Aizpurua and Rogan, 2021).

Justice is a structural requirement of life in society, serving as the axis that sustains impartiality, equity, and the protection of rights. However, traditional judicial administration, historically marked by inefficiencies, compromises the effectiveness of the system and trust in institutions. In this

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context, technological initiatives emerge as responses to operational limitations, aiming to improve procedural management and reconfigure the logic of justice through more agile and transparent procedures (Bhatt et al., 2024).

Based on these considerations, efficiency in judicial systems is decisive for maintaining legitimacy and preserving confidence in the political system, whose deterioration may generate significant economic consequences. This is because the judiciary plays a central role in consolidating civil society and defending the rule of law by ensuring the protection of fundamental rights and providing fair solutions to social conflicts (Vasconcelos et al., 2023).

From the perspective of this study, it is believed that the correctional activity can be compared to quality audits, insofar as the focus is not restricted to the identification of failures, but rather to the verification of evidence that the procedures adopted are in compliance with previously established requirements, standards, and guidelines. Within this logic, it is also considered that correctional activity involves the assessment of the existence of institutional mechanisms capable of preventing the recurrence of irregularities, from the investigation of their causes to the analysis of the effectiveness of the corrective measures applied (Micheletto, 2023).

In this context, the review and continuous improvement of processes become a strategic component of knowledge management and organizational quality, with the purpose of enhancing the technical competence of teams and fostering an institutional culture oriented toward learning and adaptation to changes in the external environment. This approach favors risk anticipation and intensifies performance levels by leveraging employee activities as a resource for achieving organizational excellence (Espíndola et al., 2019).

On September 25, 2026, official data from the Federal Police's ePol system recorded 52,211 police investigations in progress in Brazil (Polícia Federal, 2026). This number demonstrates the scale of judicial police activities in the country and, at the same time, highlights the importance of monitoring these procedures, whether to identify possible problems in their processing or to support internal control activities.

Thus, the absence of structured causal analysis methods in correctional activity can be observed, as despite the institutional commitment to supervising and correcting irregularities in judicial police activities, there remains a gap between internal control activities and the adoption of practices aimed at continuous improvement. Corrective interventions are often isolated and do not follow a structured model that ensures the non-recurrence of probl ems and promotes procedural efficiency. Therefore, this study aims to propose the development of a complementary framework for the correctional activity of the Brazilian Federal Police, based on quality management tools and methods for the analysis, correction, and prevention of nonconformities, with the goal of enhancing effectiveness in the exercise of investigative functions.

2 THEORETICAL BACKGROUND

2.1 Continuous improvement, PDCA, and Method of Problem Analysis and Solving (MASP)

Continuous improvement is characterized as an organizational capability through a systematic process that involves a set of improvement techniques and incremental innovation, carried out in a participatory manner and oriented toward measurable performance results when employed with high frequency (Bessant et al., 1994). It is also a renewal cycle that varies among organizations according to their needs, but which, supported by the revision of beliefs, competencies, and attitudes, seeks to improve business efficiency and flexibility (Savolainen, 1999).

From this perspective, management commitment must be materialized through the provision of resources, including budget allocation for projects, spaces, and infrastructure for training, offering support for better execution of initiatives. Beyond material inputs, top management also sustains the conditions for team engagement by means of internal policies that foster cooperation among areas, recognition, and rewards for achieved results (Lizarelli et al., 2021).

This organizational arrangement creates a favorable scenario for innovation to emerge as a result of the improvements implemented, both in technological and organizational dimensions. Accordingly, the use of advanced analytical tools makes it possible to examine large volumes of data, detect anomalies and pattern deviations that may indicate system vulnerabilities and potential security breaches, and thereby anticipate responses through preventive measures and direct corrective actions (Yu et al., 2024).

It is worth noting that root cause analysis and treatment reduce exposure to sanctions and strengthen stakeholders' trust in the commitment to and protection of information, democratizing access to evidence and operational guidance for informed decision-making. In turn, the iterative nature of continuous improvement is strengthened as the effects of changes are measured and

learning from new data is incorporated, maintaining an evolutionary posture of internal processes (Żywiołek, 2025).

Among the analytical instruments, the PDCA cycle stands out. It is a model developed by the American physicist Walter Andrew Shewhart in the early twentieth century and disseminated by Deming, which has been progressively systematized as an instrument for standardization and quality improvement (Jagusiak-Kocik, 2017). In this sense, the procedure is marked by a four-stage spiral cycle, based on the principles of planning (P), execution or doing (D), checking (C), and acting (A), which promotes problem identification, solution experimentation, and the implementation of effective changes (Isniah et al., 2020).

According to Campos (2014), planning involves delimiting the problem through data collection, defining goals and indicators, and specifying an action plan; execution consists of putting the plan into practice while recording evidence and results; checking corresponds to analyzing data and comparing them with goals, verifying indicator deviations; finally, acting implies correcting causes, standardizing favorable results, and disseminating findings through training.

If the actions executed do not achieve the expected success, the cycle is restarted: the problem is reexamined with new evidence, hypotheses are adjusted, and a new PDCA iteration begins. After achieving the established goals, solutions are embedded in the institution through a process of standardization and updating of the document and records control system, ensuring the continuity of the work developed (Santos et al., 2020).

The instruments that support continuous improvement, such as quality tools, play a functional role in the PDCA: (i) diagnosis and hypothesis formulation (stratification; cause-and-effect diagram), (ii) prioritization of efforts (Pareto chart), and verification/monitoring of results (check sheet; histogram; scatter diagram; control charts). The focus lies on organizing data, identifying and prioritizing problems, and evaluating results, rather than on procedural descriptions (Toledo et al., 2013; Carpinetti, 2016).

The case study developed by Amaral et al. (2022) in an automotive manufacturer applied PDCA to optimize the internal milk run, standardizing supply and material flow to define the optimal logistics train cycle, reducing waste and movement. In the healthcare field, Zhong et al. (2023) applied PDCA in 11 public Class IIIA hospitals in western China, assessing clinical managers' cognition and associated factors.

To achieve sustainable balance and cost reduction, Nguyen et al. (2020) used PDCA to replace polystyrene with sustainable materials in the packaging of stone slabs, aiming to improve quality while keeping additional costs ≤ 20%. In the aluminum can industry, Statistical Process Control (SPC) was applied via PDCA, supported by a cause-and-effect diagram, Nominal Group Technique (NGT), and 5W1H, to increase capacity in the Drop Impact Resistance (DIR) test (Sunadi et al., 2020).

Meanwhile, the Method of Problem Analysis and Solving, developed by the Union of Japanese Scientists and Engineers (JUSE), strategically structures improvement reasoning based on facts and data, guiding the reduction of process variation. In quality control, the method can be employed both for maintenance and performance improvement, as it requires empirical evidence at each cycle stage and converts results into operational standards, fostering organizational learning, reducing recurrence, and increasing process predictability (Martins et al., 2019).

Known as Quality Control (QC) Story, MASP addresses a chained mechanism of diagnosis, intervention, and institutionalization and can be understood as a detailed version of PDCA: it begins with problem delimitation and prioritization; deepens the characterization of the phenomenon; conducts causal analysis by identifying root causes; defines countermeasures and responsibilities; executes and records implementation; verifies effectiveness against established goals; and, when successful, standardizes solutions and updates procedures (Slack et al., 2022).

2.2 Prioritization and support instruments with FMEA

FMEA is a prospective risk management method that addresses how a product, process, or service may fail (failure mode), why it would fail (causes), and with what consequences (effects). Based on this, it uses indicators to assess risk factors through the dimensions of Severity (S), Occurrence (O), and Detection (D), in order to guide preventive actions capable of increasing quality and reliability and preventing errors from reaching the final customer (Yener and Can, 2021).

Historically, FMEA emerged in the aerospace, automotive, and military environments in the mid-1950s and subsequently consolidated as a reference technique for risk analysis across various sectors. In its classical formulation, prioritization is performed using the Risk Priority Number (RPN), calculated as RPN = S × O × D on standardized scales (1–10): the higher the RPN, the greater the criticality and, consequently, the higher the intervention priority (Subriadi and Najwa, 2020).

According to Carpinetti (2016), the conduct of the method is delimited by three phases, beginning with diagnosis and prioritization, in which failure modes, causes, and control forms are mapped and

S, O, and D are assigned to define priorities via RPN. Subsequently, the action plan is defined and executed to eliminate, reduce, or control critical failures. Finally, adjustments to indicators are made, when necessary, to update procedures and standards and adapt them to the system.

From this perspective, by mapping the nature of damage or causes that could lead to failures, it becomes feasible to convert expert judgments into operational priorities, reducing the probability of recurrence and mitigating harmful consequences. In this way, this conversion addresses process variations, sustaining quality consistency in relation to the standards required by the institution, with extensions and adaptations that seek to improve the robustness of evaluations and decision-making (Hu and Salim, 2023).

In the engineering context, with increasingly complex and dynamic systems, the level of demand for process quality becomes higher, as the focus on reliability gains centrality. This reveals that, while FMEA remains a mechanism grounded in reducing process failures and the life-cycle cost of processes and products (Ouyang et al., 2022).

Zhang et al. (2023) proposed a Minimum Cost Consensus-based Failure Mode and Effect Analysis (MCC-FMEA), that incorporates limited compromise behaviors and expert tolerance, with adjustment models in an interactive process to reach a collective assessment and, if consensus is unfeasible, uses alternative models to adjust the minimum necessary or reach the maximum viable agreement. It was tested in a case of COVID-19 risks in radiotherapy, helping align assessments in a practical and transparent manner.

An integrated application of Fuzzy-FMEA developed from expert rules enabled the creation of a tool with domain-specific functions applied to the sealing process in the aeronautical sector, compared with traditional FMEA. The data obtained maintained coherence in identifying critical risks and refined prioritization by addressing uncertainties, offering a more realistic analysis and better decision support (Resende et al., 2024).

From an operational standpoint, by anticipating uncertainty scenarios and proactively establishing corrective actions, FMEA is analytically essential in project development and decision-making, since every system, product, process, or service is susceptible to contingencies that must be mitigated (Wu et al., 2021). Technically, its application evaluates such contingencies, failures, or problems that may impact not only operational aspects but also the financial and strategic factors of the business (Stanojević and Ćirović, 2020).

2.3 Correctional activity in the judicial police

Police activity primarily requires discretion in complying with legislation and protecting citizens, as it is exposed to immediate situations and high pressure. This complex environment demands internal procedures that examine conduct and assign accountability, in cases of deviation, through internal processes, acquittal, or criminal and disciplinary sanctions. In addition, the organization itself must be accountable for its own policies to prevent and address inappropriate behaviors (Lamboo, 2010).

In this way, transparency in action and the criteria guiding decisions are monitored by society. When information is made public, it serves to identify weaknesses, contributing to the optimization of system improvements and investigative processes, to bring greater credibility and impartiality to internal investigations (Kumar et al., 2023).

Considering such demands, in recent years there has been a greater concentration of studies dedicated to organizational reforms and bureaucratic factors within agencies, focusing on the creation of new police conduct policies. These initiatives primarily seek to expand transparency and transform existing normative structures, aligning police action with principles of institutional accountability and greater social legitimacy (Cassino and Demir, 2024).

In summary, the nature and quality of internal investigations often stem from organizational culture, suggesting that correctional policies will only be effective if integrated into an institutional culture (Walker, 2007). It is thus observed that this activity has, among its objectives, the function of monitoring the evolution of performance indicators, disseminating good practices, identifying potential problems, and tracking results, becoming more effective when it gains transparency and proactive public oversight within a broader set of issues (Chanin and Espinosa, 2016).

In light of this, correctional activity within the Brazilian Federal Police has an internal control mechanism over the functions of the judicial police, aimed at detecting failures and monitoring investigations. Under this framework, responsibility for supervision at the national level is assigned to the Office of the Inspector General, and to the Regional Inspectorates, at the state level, which monitor the effectiveness, timeliness, and correction of identified nonconformities, operationally referred to as partial, ordinary, and extraordinary inspections, as well as inspections (Micheletto, 2023).

Table 1 summarizes the main contributions of the studies discussed in this section regarding police accountability, transparency, organizational culture, and correctional activity.

Table 1 - Summary of studies on police accountability and correctional activity

Study	Main focus	Main findings/contributions
Lamboo (2010)	Internal investigations and police misconduct	Uniform registration of internal investigations contributed to improved accountability and provided relevant information on the nature and extent of police misconduct.
Walker (2007)	Police accountability mechanisms	Internal accountability involves formal policies, supervision, performance evaluation, early intervention systems, and misconduct investigations. The study also identifies limited evidence regarding the effectiveness and management of internal investigation procedures.
Chanin and Espinosa (2016)	Police transparency, civilian oversight, and leadership	Police executives associated civilian oversight with accountability, transparency, community trust, and police–community relations. Internal leadership values also influenced organizational transparency.
Kumar et al. (2023)	Police accountability and transparency	Technology, data analysis, oversight mechanisms, and community engagement can support police accountability and transparency and help identify areas for improvement.
Cassino and Demir (2024)	Police reform and police misconduct	Comprehensive police reform was associated with a significant reduction in overall police misconduct and misconduct involving the use of force, highlighting the potential effects of institutional policies and accountability mechanisms.

Source: The Authors.

Taken together, these studies highlight internal investigations, accountability mechanisms, transparency, data use, and institutional policies to support police oversight and organizational improvement. However, in the literature analyzed in this study, little attention has been given to the structured integration of correctional activities with continuous improvement methods and quality management tools for the systematic identification, analysis, prioritization, and treatment of nonconformities. This gap provides the basis for the approach proposed in the present study.

3 METHODOLOGY

The present research is characterized as a case study, as it investigates a complex phenomenon embedded within its real-life context (Voss et al., 2002). Regarding its nature, it is an applied research, since it seeks to offer practical solutions to a problem identified within the institution (Yin, 2018). With respect to its approach, it is considered a qualitative–quantitative study, because in addition to measuring data related to the problem, it seeks to capture perceptions and information from the perspective of individuals within their operational environment (Forza, 2002).

To this end, an initial mapping of the problems that occurred at the Superintendence of the Brazilian Federal Police in the State of São Paulo (SR/PF/SP) was carried out, which resulted in "correctional alerts," based on data extracted via Business Intelligence (BI), as provided for in summary inspections. Additionally, findings from ordinary inspections conducted in one of its units were considered, which served as the basis for proposing the application of the PDCA cycle combined with other quality analysis instruments, in order to enable an in-depth assessment of nonconformities, the definitive elimination of their causes, and the continuous improvement of the system.

3.1 Instrument and data collection

The study was conducted using the analysis of administrative records from the Superintendence of the Brazilian Federal Police in the State of São Paulo (SR/PF/SP) as its primary instrument. Initially, a survey of the main problems that resulted in the issuance of "correctional alerts" was carried out through the extraction of information made available by the BI system used in summary inspections. Complementarily, problems identified in the reports of ordinary inspections conducted in one of its units were also considered.

These datasets constituted the empirical basis of the research, making it possible to identify and characterize critical points within the institution's internal processes. Based on the analysis of this

material, the use of the PDCA cycle, combined with other quality management tools, was proposed as a strategy to deepen the analysis of nonconformities, definitively eliminate their causes, and establish a continuous system improvement process.

3.2 Procedures and data analysis

Data analysis was conducted in stages, following the phases of the PDCA cycle. Initially, records extracted from the BI system and inspection reports were organized into spreadsheets to identify patterns such as delays, recurrence of problems, and the distribution of occurrences by unit and alert type. At this stage, the use of Pareto charts made it possible to identify groups of investigations with the greatest impact on duration indicators, guiding the selection of priority intervention focuses.

Subsequently, the qualitative and quantitative data were analyzed by a multidisciplinary team composed of six staff members who worked in judicial police activities and were directly involved with police investigations in progress within the SR/PF/SP. The team participated in the application of quality tools over a two-day period. To support the analysis of the identified problems and their possible causes, the brainstorming technique was used. Regarding the problems identified in the summary inspections, the Ishikawa Diagram was structured based on the categories of manpower, machines, methods, and measurement, within which the possible causes identified by the team were organized. For the problems identified in the routine inspections conducted over a three-year period, the police investigation process, from its initiation to its closure, was initially analyzed through brainstorming supported by a process flowchart. Based on this flowchart, the critical stages of the process related to the deadlines for issuing and complying with orders, the movement of case files in ePol, and the processing of case files in Electronic Judicial Process (PJe) were identified.

Subsequently, FMEA was applied to identify the failure modes, their possible causes and effects, as well as the existing controls. Thus, the team evaluated each failure mode using the Severity (S), Occurrence (O), and Detection (D) scales adopted in the study, with scores ranging from 1 to 10. Severity assessed the impact of the failure on the investigation and the damage to the individual or Public Administration, ranging from no impact or damage (1) to very high impact and damage (10). Occurrence was assessed based on the estimated probability of occurrence of the failure, ranging from less than 1:100,000 (1) to 1:2 (10). Detection considered the probability of identifying the failure using the existing controls, ranging from 85–100% (1) to 0–5% (10). Then, the Risk Priority Number (RPN) was calculated as S × O × D, being used to prioritize the identified failure modes.

4 RESULTS

The data were analyzed through the application of the PDCA cycle, aligned with the stages of the MASP, according to the correctional activities of the Brazilian Federal Police, as illustrated in Figure 1. It is emphasized that the execution of the PDCA cycle, within the institutional context, should be conducted by teams composed of personnel involved in work processes and police procedures subject to correctional control.

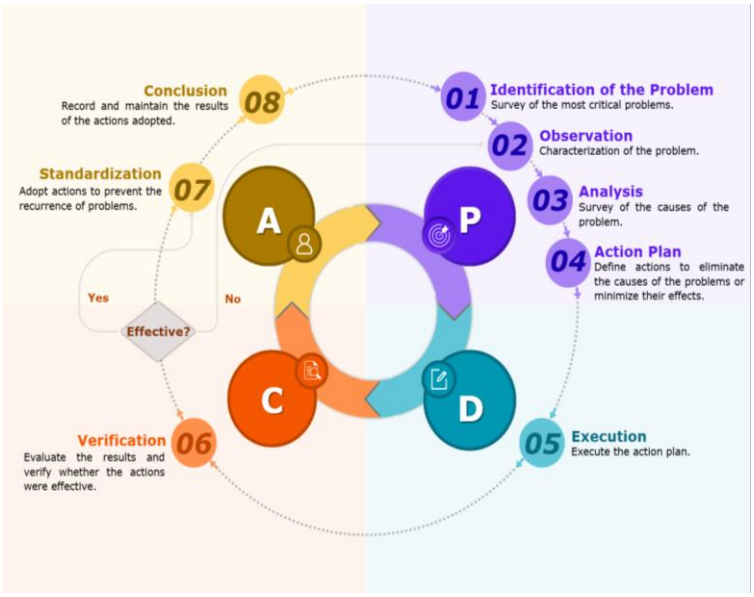

Figure 1 - PDCA cycle for improvements in correctional activities
Source: Adapted from Campos (2014).

To this end, quality tools, specific methods, inspection reports, and BI indicators were used, creating an analytical system focused on improving correctional activities, from problem identification to the standardization of solutions. Through this approach, processes can be continuously monitored and adjusted as needed over time, increasing diagnostic capacity and raising standards of efficiency and administrative transparency within the Brazilian Federal Police, as shown below.

The initial stage corresponds to planning, in which the problem is identified, data are collected, goals are defined through performance indicators, and the means to achieve them are organized by means of an action plan, in accordance with phases 1 to 4 of the MASP, as represented in Figure 2.

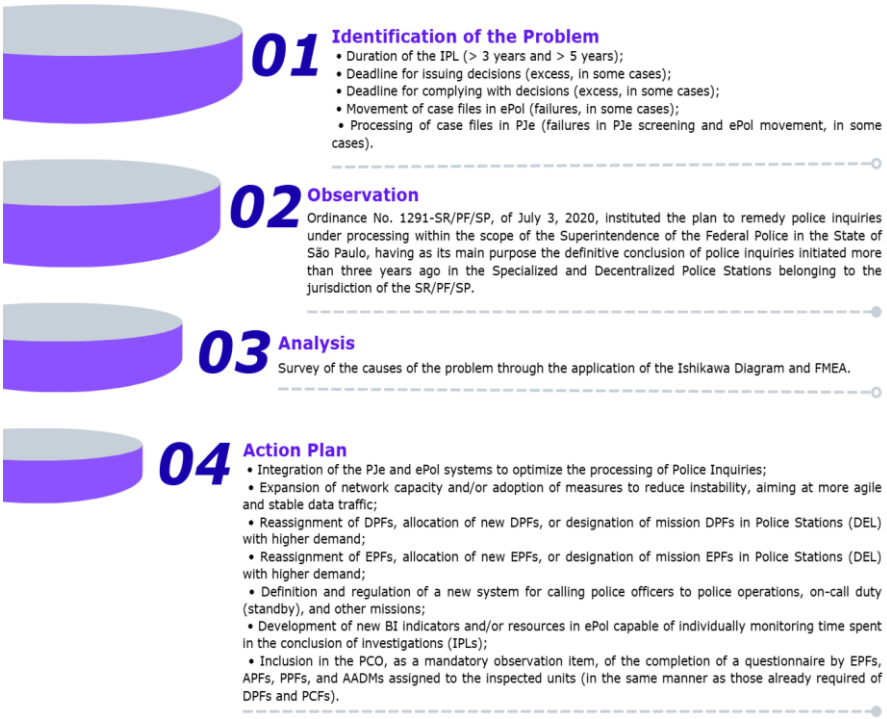

Figure 2 - P stage of the PDCA cycle and corresponding MASP phases
Source: The Authors.

Based on this structure, the consolidation of data obtained from the different correctional modalities was initiated in order to map the most significant alerts, since this allows the magnitude of nonconformities to be assessed and patterns of recurrence that affect the processing of police investigations to be identified. With the support of the observed data, it is possible to distinguish circumstantial failures from structural problems that exert greater influence on procedural delays.

For the specific case under analysis, the investigation of the problems considered summary inspections (quantitative), ordinary inspections (qualitative), partial inspections, and extraordinary inspections. In the summary inspections, problems are detected through Business Intelligence (BI) indicators, with subsidiary support from the Pareto Chart. For this purpose, a survey of correctional alerts was adopted, carried out in September 2022, related to Police Inquiries (IPLs) of the SR/PF/SP, namely: IPL Duration > 3 years; IPL Custody Duration > 1 year; Overdue IPL > 10 days; IPL External Location > 120 days; IPL Duration > 5 years. The alerts were organized as shown in Table 2.

Table 2 - Survey of IPL alerts

Alert Type	Ongoing Cases
IPL Duration > 3 years	769
IPL Quota Duration > 1 year	340
IPL Overdue > 10 days	306
IPL External Location > 120 days	224
IPL Duration > 5 years	216

Source: The Authors.

Among these, the problems that require more complex analysis are concentrated in the oldest investigations (> 5 and > 3 years), which constitute the focus of this study for the summary modality. The remaining alerts allow for simpler interventions, without prejudice to causal analysis when

pertinent. It is important to emphasize that the reduction of deadlines does not depend solely on internal actions, given the procedural and legal nature of the proceedings; therefore, this study is restricted to failure modes and improvement actions within the police scope, in accordance with senior management guidelines.

Meanwhile, problems related to ordinary inspections are identified based on the inspection reports of one unit of the SR/PF/SP from 2019 to 2021, as presented in Table 3. In the case of partial inspections, as they are intended for the analysis of form and merit, already covered in ordinary inspections and whose results may be incorporated into their reports, no specific survey was conducted. Likewise, for extraordinary inspections, no separate survey was carried out, since their procedures are already observed in the other modalities.

Table 3 - Parameters identified in ordinary inspections

Ordinary Inspections	Actions
2019	Deadline for issuing orders Deadline for complying with orders
2020	Processing of case files in PJe Deadline for issuing orders Deadline for complying with orders
2021	Deadline for issuing orders Deadline for complying with orders Movement of case files in ePol

Source: The Authors.

During the observation phase, problems are characterized based on inspection reports and BI indicators, and it is the responsibility of the head of the unit where the cycle is applied to verify their relationship with institutional goals and internal regulations. In light of the above, Ordinance No. 1291-SR/PF/SP is highlighted, which established the remediation plan for investigations initiated more than three years ago.

Correctional activity has as its main objectives monitoring the evolution of performance indicators, disseminating good practices, identifying potential problems, and monitoring achieved results. Thus, the aforementioned ordinance primarily seeks to ensure the definitive conclusion of long-running police investigations underway in the Specialized and Decentralized Police Stations of the SR/PF/SP.

The investigation of root causes was conducted using different methods, according to the type of inspection. In summary inspections, the Ishikawa Diagram was applied, structured around the factors of manpower, machines, methods, and measurement. Among the secondary causes identified were staff overload due to the excessive number of IPLs and frequent assignments to operations and duty shifts, the complexity of investigative actions, procedural appeals that prolong processing, and limitations of information systems, such as instability, slowness, and monitoring difficulties.

Table 4 - Failure modes and causes

Failure Mode	Cause
Excessive time for case file movement (MPF: Federal Public Prosecutor's Office return – entry)	Excessive number of IPLs to be processed
	System slowness and instability during peak hours
	Absences of the designated Federal Police Clerk (EPF) due to police operations, on-call duty or other assignments
Excessive time for issuing orders	Excessive number of IPLs to be ordered and excessive workload
	System slowness and instability during peak hours
	Absences of the designated Federal Police Chief (DPF) due to police operations, on-call duty or other assignments
Excessive time for complying with orders	Excessive number of orders to be fulfilled and excessive workload
	System slowness and instability during peak hours
	Absences of the designated EPF due to police operations, on-call duty or other assignments
Excessive time for case file movement	Excessive number of IPLs to be processed
	System slowness and instability during peak hours
	Absences of the designated EPF due to police operations, on-call duty or other assignments

Source: The Authors.

In ordinary inspections, FMEA was applied, as presented in Table 4. Initially, a flowchart of the police investigation processing procedure was developed to identify critical issues related to compliance with dispatch deadlines, the movement of case files in ePol, and processing in the PJe system. Based on these findings, failure modes and their possible causes and effects were defined. Subsequently, the team assessed severity, occurrence, and detection indices in order to rank process deficiencies using the Risk Priority Number.

According to the FMEA form, the main failure modes identified were excessive time for case file movement (either upon return from the MPF or upon expiration of investigative deadlines), excessive time for issuing dispatches, and delays in complying with dispatches. These factors result in delays in the continuity of ongoing investigations, which, according to the severity scale, represent high detriment to investigations and potential significant damage to both individuals and the Public Administration, being classified between high and extreme levels.

In ordinary inspections, classification by the occurrence scale indicated that failures such as an excessive number of IPLs to be moved and dispatched, overload of dispatches to be complied with, and system instability were configured as frequent failures, with an estimated probability of 1:100 (level 8 on the scale). Absences of delegates and clerks, motivated by operations, duty shifts, or replacement of managerial positions, were also categorized as frequent, although with a lower probability (1:200, level 7).

Subsequently, the evaluation using the detection scale showed that the currently existing controls have relative effectiveness, with an average index of 3, which corresponds to a detection probability between 65% and 75%. From the combination of the Severity, Occurrence, and Detection indices, the RPNs were calculated. The combinations S = 9, O = 8, and D = 3 resulted in an RPN of 216 (9 × 8 × 3), whereas the combinations S = 9, O = 7, and D = 3 resulted in an RPN of 189 (9 × 7 × 3). The maximum value obtained (RPN = 216) indicated the need to prioritize measures aimed at integrating the PJe and ePol systems, expanding technological capacity, and redistributing or reinforcing staff in units with higher demands.

This result shows that the main bottlenecks were not only associated with individual conduct, but also with structural and technological limitations of the system, which highlights the need to address nonconformities from a process-oriented perspective. The combination of causes related to workload overload, system instability, and procedural complexity reinforces that the identified factors are responsible for delays.

Based on the causes identified through the Ishikawa Diagram and the priorities established by the FMEA, an action plan was developed using the 5W1H tool. The plan defined the proposed actions, responsible parties, deadlines, locations, reasons, and implementation procedures, as summarized in Table 5.

Table 5 - 5W1H action plan

Action	What	Who	When	Where	Why	How
1	Integrate PJe and ePol systems	General Internal Affairs Office (COGER)	Mar/23	PF Headquarters	Accelerate the processing of police investigations and reduce investigation completion time	Technical adjustments through joint actions between COGER and Federal Regional Court (TRF) technical teams
2	Expand network capacity and/or adopt measures to reduce system instability	Head of the Information Technology Sector(STI)	Dec/23	SR/PF/SP	Improve the efficiency of electronic processing and reduce investigation time	Assess information technology system and resource needs, considering technical feasibility and costs, for submission to the SR

3	Reallocate, assign new, or temporarily designate DPFs to units with higher demands	Regional Superintendent(SR); Regional Chief of Judicial Police(DRPJ); Head of the Police Unit (DEL)	Feb/24	SR/PF/SP	Promote a more equitable workload distribution, improving process flow and productivity	Assess the number of IPLs per DPF to identify units and staff with the highest workloads
4	Reallocate, assign new, or temporarily designate EPFs to units with higher demands	SR; DRPJ;DEL	Feb/24	SR/PF/SP	Promote a more equitable workload distribution, improving process flow and productivity	Assess the number of IPLs per EPF to identify units and staff with the highest workloads
5	Establish and regulate a new system for assigning police staff to operations, on-call duty, and other missions	Regional Executive Chief (DREX)	Nov/23	SR/PF/SP	Prevent staff assignments from compromising investigations and units with critical workloads	Form a multidisciplinary working group to establish new criteria and prepare a Service Instruction
6	Develop BI indicators and/or ePol resources to individualize the time spent at each stage of IPL processing	COGER	Mar/24	PF Headquarters	Identify process bottlenecks more accurately and better direct improvement actions	Prepare a proposal for submission to Regional Internal Affairs Office (COR) and COGER for feasibility analysis and implementation
7	Include mandatory completion of a questionnaire by EPFs, Federal Police Agents (APFs), Federal Police Fingerprint Experts (PPFs), and Administrative Agents (AADMs) in the Ordinary Inspection Plan (PCO)	COR	Jan/24	SR/PF/SP	Increase staff participation in identifying problems and difficulties and support resource optimization and system improvement	Prepare a proposal for submission to COR for analysis and implementation

Source: The Authors.

As seen in the results obtained, the joint application of PDCA and quality tools made it possible to organize different types of information from correctional activity into a structured sequence of analysis, starting with the identification of problems, moving through the analysis of their possible causes and the prioritization of risks, and ending with the definition of actions. These results are aligned with the literature on PDCA and MASP, which highlights the systematic use of data and

analytical tools to structure the identification, analysis, and treatment of problems (Toledo et al., 2013; Carpinetti, 2016; Martins et al., 2019).

In the literature analyzed, studies on correctional activity are mainly directed toward issues related to internal investigation, accountability, transparency, oversight, and institutional policies (Lamboo, 2010; Walker, 2007; Chanin & Espinosa, 2016; Kumar et al., 2023; Cassino & Demir, 2024). In this sense, the results of this study complement this literature by exploring correctional activity through analytical tools for continuous improvement, using information derived from control measures to analyze the causes of problems, prioritize the identified risks, and direct improvement actions.

Furthermore, the prioritization of failure modes through the application of FMEA directed the analysis toward factors related to workload overload, limitations of information systems, and staff distribution. These results are consistent with Subriadi and Najwa (2020) and Yener and Can (2021), who consider failure modes, their causes and effects, and existing controls to assess risks and establish intervention priorities. In the case analyzed, this assessment made it possible to identify the problems that should be prioritized and subsequently considered in the definition of improvement actions.

Considering this framework, the data derived from the FMEA directed efforts toward interventions with greater potential impact. Integrated with the PDCA cycle, correctional activity ceases to have a predominantly reactive character and begins to operate with a preventive and data-driven focus. In this scenario, the measures were structured in the execution phase. This stage materializes the action plan through evidence and interventions aimed at improving the correctional workflow.

Among the actions, the integration between the PJe and ePol systems stands out, as well as the assessment of technological needs, focused on identifying instabilities and limitations. In terms of management, the number of IPLs under the responsibility of Delegates and Clerks was determined in order to identify units with greater overload and to support the possible redistribution of personnel.

In addition, the proposal included the creation of a new system for assigning staff to operations and on-call duty schedules, reducing absences that compromise procedural progress. The action plan also included the mandatory completion of a questionnaire by EPFs, APFs, PPFs, and AADMs within the PCO, aimed at supporting the identification of problems and difficulties in the inspected units. In conclusion, the development of BI indicators and new functionalities in ePol was included to individually monitor processing times and optimize internal control. These actions, summarized in Figure 3, constitute the operational core of the continuous improvement plan.

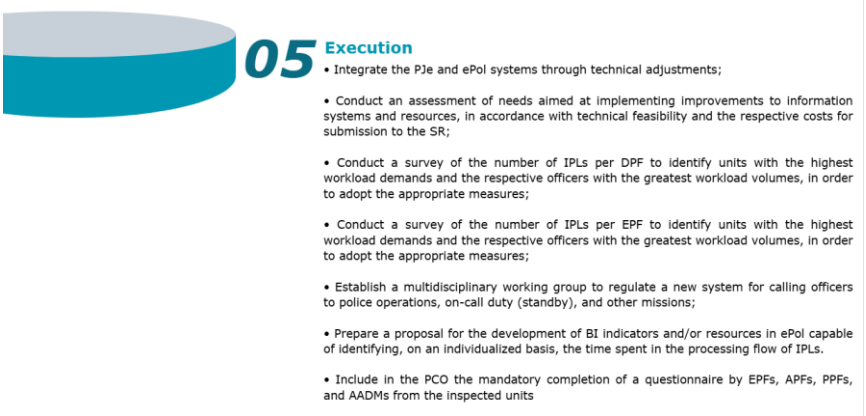

Figure 3 - Execution of the action plan
Source: The Authors.

The verification phase was addressed in a prospective manner, based on the proposed systematic analysis and the potential use of indicators derived from summary and ordinary inspections, such as the Pareto Chart and FMEA. From this perspective, these instruments were considered capable of supporting, in future applications, the monitoring of the behavior of nonconformities over time, as well as the identification of trends associated with the duration of IPLs and delays in dispatches.

Similarly, standardization was analyzed from the perspective of its feasibility, considering the incorporation of the formal registration of the proposed improvements into the routine of the units, through the updating of flowcharts, service instructions, and standard operating procedures. These elements tend to contribute to the stability of the new practices as a tool to prevent the recurrence of the mapped failures, as well as to the documentary management of the investigative process.

Figure 4 synthesizes the last three phases of the cycle; however, it does not represent the proposed framework in its entirety but rather synthesizes its final stages. The proposed framework comprises the integrated application of the PDCA cycle and the quality management tools described throughout the preceding stages. This structure also makes its adaptation to other organizational contexts that use process control and monitoring activities possible, since the tools are applied according to the problems identified and the characteristics of each process analyzed.

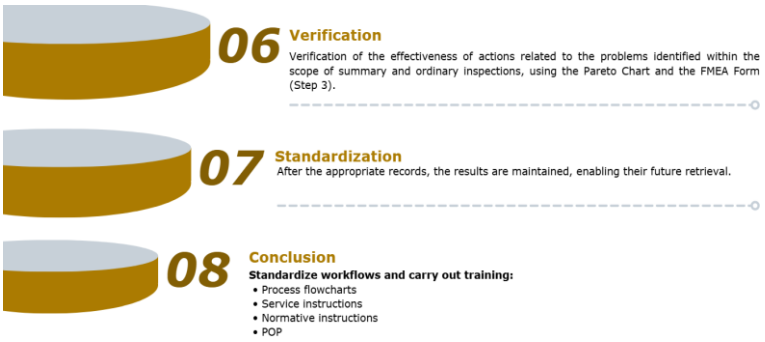

Figure 4 - Verification, standardization, and conclusion of the cycle
Source: The Authors.

Thus, the final phase referring to the conclusion stage highlighted the need for continuous training of all teams involved. It is considered that the implementation of the previously projected actions tends to favor alignment among personnel and the construction of a system resilient to demands. Taken together, the proposed solutions indicate potential to strengthen the continuous improvement cycle, as they are gradually incorporated into organizational routines.

Regarding the improvement of the case-study process, future applications should provide organizational conditions that facilitate the participation of the multidisciplinary team, since reconciling the activities of the study with the staff members' routine demands was one of the main difficulties observed. In addition, the incorporation of the proposed approach into the institution's normative structure and its standardization through standard operating procedures may contribute to its application in other units. Finally, subsequent applications should include monitoring the implemented actions and their results, allowing the effectiveness of the proposed improvements to be assessed over time.

5 CONCLUSIONS

Correctional activity, as a mechanism of internal control, seeks to identify deviations in the conduct of investigations and judicial police procedures, as well as to monitor results, quality, timeliness, and irregularities. In alignment with these premises, the present study presented a structured system integrating the PDCA cycle and a combination of analytical prioritization tools, in order to qualify the treatment of nonconformities and guide interventions.

The research results indicate that the application of the methodologies has the potential to contribute to the optimization of the processing of investigations, the reduction of delays, improvements in the predictability of stages, and a more balanced distribution of workloads. It is also observed that the initial structuring of the PDCA cycle, together with quality management tools, tends to foster the development of greater traceability of operational flows, resulting from the standardization of routines and the institutionalization of continuous improvement techniques. In this sense, it is expected that such advances will contribute to more stable processes that are more closely aligned with the organizational guidelines of the Federal Police, as the system is applied over time.

As a limitation, the need for a high level of engagement from staff involved in investigative routines is highlighted, which represented a challenge due to the accumulation of daily activities. Nevertheless, despite these constraints, the experience demonstrated the feasibility and potential for replication in other units of the institution, provided that adaptations are made to the operational specificities of each context.

From a practical perspective, the proposed approach provides managers with a structured process to identify, analyze, prioritize, and address nonconformities detected through correctional activities, in addition to providing information for the definition of responsibilities and corrective and preventive actions. Furthermore, its application can be extended to other Federal Police units and activities, provided that local workflows, institutional responsibilities, and operational conditions are

considered. In this sense, the standardization of the approach through institutional procedures can favor its replication and incorporation into organizational routines.

In addition to the contributions presented, the study showed that the integrated use of tools and performance indicators offers a model to enhance internal control and investigative efficiency. Although the study is limited to the context of SR/PF/SP, its application demonstrates diagnostic capacity to guide priority interventions and sustain long-term improvements in complex processes, in line with institutional commitments to greater timeliness and transparency and value delivery to society.

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