



Improving the process of assisting refugee applications in border states using the Soft Systems Methodology: a case study in Brazil

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ABSTRACT

Humanitarian and economic crises are driving migratory movements around the world. Natural disasters and political and economic crises are major drivers of migration. Migration played a significant role in the spread of COVID-19. Brazil recognizes its duty to protect refugee immigrants. Immigrants are received at the country's borders by the Brazilian Federal Police, a public law enforcement agency responsible for immigration control and refugee requests. This study proposes improvements in the process of assisting refugee applications in the border states of Brazil, using the Soft Systems Methodology. Proposals were developed to improve the process for refugee requests and raise the quality of assistance to migrants in high-demand border states. This study is innovative, as the proposed actions enable better use of the available human and material resources for activities, resulting in greater efficiency in the service process. This case study was carried out at the Regional Superintendence of the Federal Police in Roraima (Brazil). The proposals can be adopted in other units of the PF, especially where there is high demand for refuge applications and significant resource constraints in these complex scenarios. They also have potential to be applied in other areas of the agency. The proposals have a significant social impact by providing a more efficient public service.

1. Introduction

Migration is a worldwide phenomenon. It presents a dynamic process, directly linked to the historical context, in which migrants' characteristics, motivations, and needs change significantly over time [1, 2, 3]. Natural disasters and political and economic crises are major drivers of migration. Migration played a significant role in the spread of COVID-19 [4]. As a rule, a migrant is an individual who voluntarily leaves their country to live elsewhere, motivated by a desire for change, family or personal reasons, or even economic reasons [5, 6].

In recent years, the number of refugee applications in Brazilian border states has increased [6], particularly due to sociopolitical crises in several countries. The fear of persecution for reasons of

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race, religion, nationality, social group, or political opinions [7] has motivated countless foreigners to migrate to Brazil, especially by presenting refugee requests.

The Brazilian Federal Police (PF) is the body responsible for the Administrative Police's activities in migration control. In an attempt to move to Brazil, the migrant will be received by the PF at borders and at land or air entry points [8]. Institutions such as the PF have traditionally played an important role in the immigration process. The discussion around this problem arose with the Haitian migration to the State of Acre [9], and has now intensified with the Venezuelan migration crisis in the State of Roraima [10]. According to data from the PF [8], the number of refugee applications submitted in the State of Roraima increased between 2015 and 2018, with a particular emphasis on Venezuelan migration. The number of immigrants who seek the PF in Roraima is increasing, and the growth occurs at independent, random scales over which there is no prediction or control. There are hundreds of migrants who cross the border daily, in subhuman conditions. They wait for assistance for migratory regularization, questioning the respect for human rights and the commitments assumed by Brazil internationally [11]. On the other hand, the human and material resources available to the PF are limited (subject to an annual budget limitation and a determined number of civil servants). Then, in a short time, there are no conditions to expand capacity or reinforce the structure of the border unit through the relocation of resources alone. In this context, access to updated knowledge can support decisions in the public sector [12]. Thus, the importance of aligning resources and knowledge capacity to formulate strategies and make strategic decisions within the scope of the PF is highlighted.

This study proposes improvements to the process of assisting with refugee applications in Brazil's border states, using the Soft Systems Methodology [13]. To this end, alternative actions by the Brazilian Federal Police are identified to improve the quality of assistance to migrants in high-demand border units. This study is innovative, as these actions enable better use of available human and material resources for the activity, resulting in greater efficiency in the service process.

Given the emergency in the State of Roraima and the economic and political crisis in Venezuela, it is important to note that the suggested improvements can be adopted across all Federal Police border units. This will be possible through effective knowledge sharing, especially in contexts with high demand for refugee applications and significant resource constraints.

1.1 Public Administration

The challenge faced by public organizations is to transform administrative and bureaucratic structures into flexible ones to deliver public value to citizens [14]. There is a positive relationship between public service employees' contact with citizens and job satisfaction. In this context, the administrative planning function is one of the main tools for transforming public management [15]. Widely used in the private sector, strategic planning has been increasingly used in the public sector [16]. This happens for two basic reasons: the growing scarcity of financial and human resources, which require their rationalization and optimization, and the growing demand for quality public services [17].

Public service providers have been playing an increasingly broad and relevant role in Brazil, developing assistance, educational, cultural, sports, research, and other services. Although they do not base their growth strategies on competition, public entities' development strategies are based on achieving social objectives that justify their existence in the environment in which they operate [14].

About institutional identity, public organizations are created to meet a specific societal need, a reality that increasingly demands transparency in public-sector operations [18]. Also within the scope of public administration, the planning action allows for a systemic view of the organization's possibilities and difficulties, clearly explaining the objectives to be achieved and the actions necessary to achieve them. In this sense, the roles of leaders and employee motivation in promoting job engagement in public administrations are highlighted [19]. In addition, practices such as removing barriers associated with innovation and encouraging activities that make jobs more interesting can reduce server turnover.

The Federal Police, as a public institution, has no concern with competitiveness or profitability [8]. However, globalization and technological development have made citizens more demanding. Thus, the Brazilian Federal Police must be prepared to assist them. Therefore, it is vital to develop an evolutionary and flexible strategic plan that maximizes the use of available resources. Methodologies that enable effective public management are necessary to support strategic management and to share knowledge about organizational problems in response to key issues for the decision-support process and, consequently, for strategic management. Adequate knowledge management is an essential part of an organization's success. The process of knowledge management involves creating, accumulating, and facilitating the effective sharing of knowledge throughout the organization [20]. The concept of knowledge management is not new to the public sector. The managers must consider new management structures that encourage knowledge sharing in the execution of organizational activities.

In the context of the Federal Police, migration control is one of several administrative activities, encompassing the issuance of common and emergency passports, international migration control, the registration and issuance of a foreign identity card, instructions on the naturalization process, extradition, deportation, and instructions on the refugee process, among others [8]. The protocol for migrants' refuge requests warrants special attention and is the focus of this study.

Currently, there is a process model for assisting migrants requesting refuge, developed from observing the demands of the international community and respecting human rights. The problem is that the number of refugee requests in Brazilian Border States is high and growing, especially in states where land traffic with countries experiencing political and/or economic crises is possible. However, exactly in these Border States, the Brazilian Federal Police has more serious limitations of human and material resources to meet the demands. Observing the organizational structure is important to assess whether it facilitates or inhibits information sharing [21]. Thus, the current service process does not include the specificities of border regions and emergencies. The execution of this process results in bottlenecks that compromise not only the efficiency of the Institution responsible for the activity, but also, and mainly, hinder the effectiveness of assistance and protection for refugees in Brazil. Without the Federal Police-issued request for refuge protocol, the refugee will not have access to any public policies aimed at him.

1.2 Soft Systems Methodology

Peter Checkland developed the Soft Systems Methodology – SSM [13] from a series of research carried out in public and private organizations. This methodology proposes identifying and structuring problematic, difficult-to-define situations, aiming to relate the real world and the systemic world to solve a problem and achieve a desirable system. For this, SSM seeks to use the various views of the problematic situation from each participant's perspective to reach an accommodation among them [22]. According to [23], SSM is a generic methodology that can be

adapted to any situation. Problems are understood as situations in the real world that involve discomfort, a sense that things could be better, or the identification of a problem [24]. According to [25], this methodology seeks to enrich understanding of a given situation without focusing on offering an algorithmic solution to the supposed problem. It is mainly applied in environments where the question is not exactly “how to do something” but “what to do”. The seven stages of the SSM methodology are [26]: Stage 1 - Appreciate the problem situation; Stage 2 - Write the problem situation; Stage 3 - Formulate root definitions; Stage 4 - Build conceptual models; Stage 5 - Compare models with the real world; Stage 6 - Define possible changes; and Stage 7 - Recommend actions. There are several successful applications of SSM in different contexts in the literature [22], [27], [28].

Therefore, within the Federal Police, the application of the SSM methodology will foster an environment conducive to debate among members of the work team. For this, it is important to register, throughout the process, the opportunities for improvement identified in the discussions and in the application of the tools. All material generated during the development of the work will serve as the basis for learning and for building action plans to improve the Federal Police's migratory control activity.

2. Methodology

This case study was conducted at the Regional Superintendence of the Federal Police, in Roraima. The choice of this Unit was driven by the need to meet the numerous and growing demand of Venezuelan immigrants applying for refuge. In the initial phase, the peculiarities of the problem under study demonstrate the need for a deeper understanding of all related aspects, including their influence and interconnections. The process of assisting with refugee applications involves interests represented by various actors within the Brazilian Federal Police (such as heads of police stations, delegates, and superintendents, among others) and by external bodies and entities that interfere in the process. Thus, it appears that a complex problem is being analyzed, with diffuse and extensive information, making it difficult to visualize and reach a solution that meets the underlying interests.

In view of these findings, the adequacy of soft operational research was verified, as it focuses on qualitative aspects and accounts for the subjectivity of the decision-making process, thereby enabling learning and the subsequent creation of new alternatives to improve the process. The great advantage of the soft systems approach is its focus on structuring the problem before trying to solve it, using the notion of a system as an interrogative device that enables debate among those involved. Among the soft-approach methods, the Soft Systems Methodology proved more suitable for this study, as it supports modeling of organizational processes (business process modeling) and can be used for both general troubleshooting and change management.

3. Result

This case study was conducted by applying the stages proposed by SSM [26], as described below.

3.1 Stage 1 – Identification of the Problematic Situation

As demonstrated in the SSM methodology, the analysis stage has the fundamental task of identifying the problematic situation and obtaining the maximum information about how the current process for assisting refuge requests functions. Thus, in this first stage, the relevant legislation and regulations of the Brazilian Federal Police were analyzed, and to obtain different perspectives from

all stakeholders involved in the process, interviews, group discussions, and direct observation were conducted.

Through document analysis, a review of the Federal Police's internal regulations, and interviews with actors involved in assisting refugee requests at the Central Body and the Regional Superintendence of Roraima, it was possible to map the process and document all steps, as shown in Figure 1.

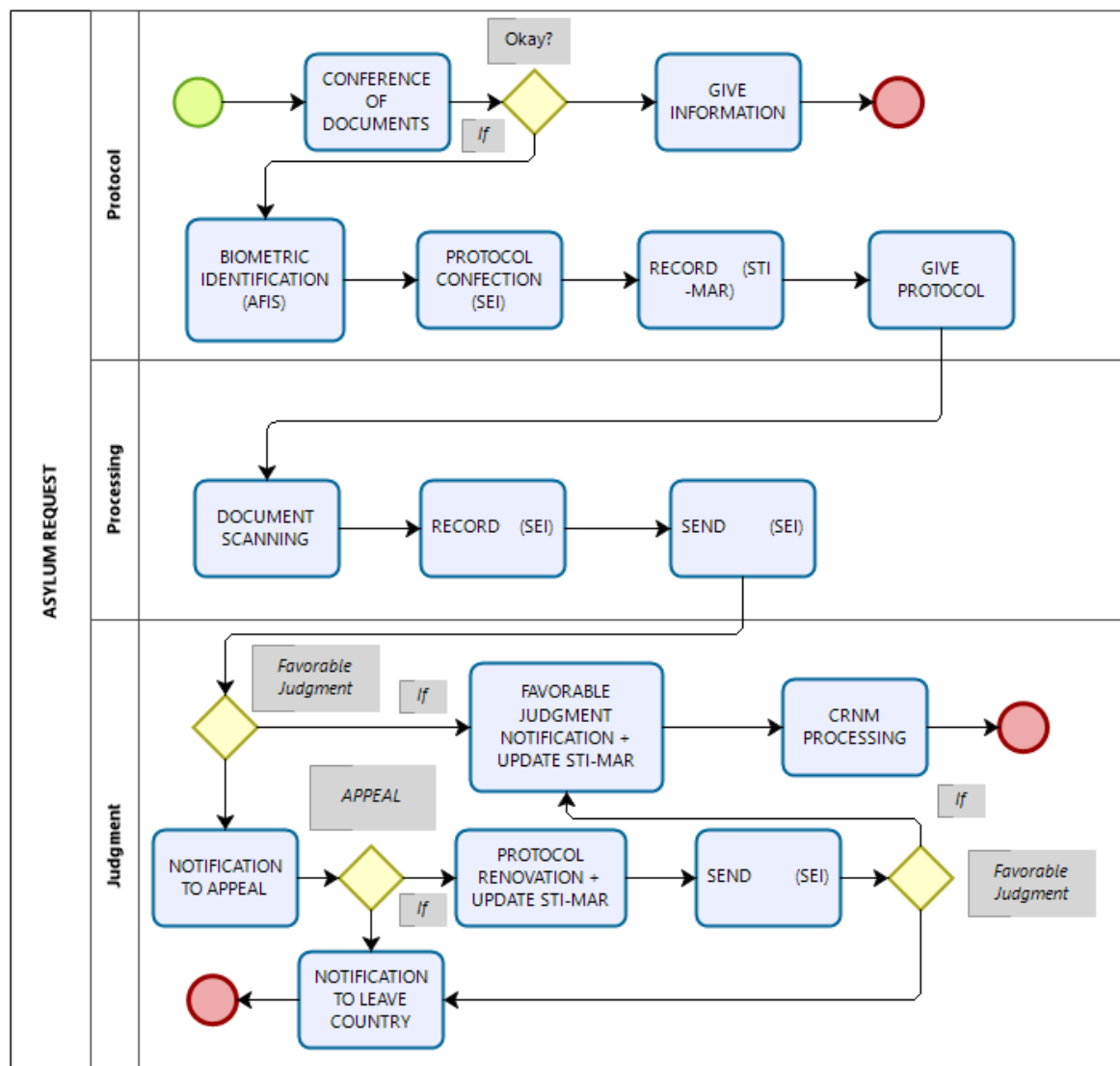


Fig. 1. Refugee application process

Although the Brazilian Federal Police acts at all stages of the process as an immigration control body, the institution is responsible only for the first two steps. The third step depends on an act on which the Brazilian Federal Police has no interference.

In addition, the first two steps of the process are decisive for the refuge request in Brazil. The two steps are directly related to the formalization of the refuge application and guarantee of the immigrant's regular stay in Brazil, with all rights and guarantees provided for in the Federal Constitution. Thus, given that the objective of this study is to improve the process of assisting with refugee applications within the Federal Police, the research focused on the first two steps shown in

Figure 1. As a nationwide standard adopted by the Brazilian Federal Police, all tasks related to assisting with refugee requests are performed by a single public servant at Police Stations and Immigration Stations. One immigrant is directed at a time. Some units use online scheduling for attendance; others distribute attendance passwords daily in the order of arrival at the Federal Police Unit.

In Roraima State, the process was segmented, and tasks were distributed among groups of servants due to the high number of requests for refuge. Public servants are assigned to perform each activity in the process. A public servant (or group of public servants) checks the documentation and provides information; another proceeds to perform biometric identification; another makes the protocol in the Electronic Information System (SEI System); another includes the data in the International Traffic System Alert and Restrictions Module (STI-MAR) System; another delivers the protocol of the request to the immigrant; another digitizes all the documentation produced; another includes the documents in the systems and sends the case to General Coordination of Immigration Police/Executive Board of the Federal Police/Brazilian Federal Police (CGPI/DIREX/PF) and National Refugee Council/Justice Ministry (CONARE/MJ). The time to attend each immigrant is approximately 1 (one) hour. An average of 500 immigrants are served each day by a total of 40 civil servants and service providers.

Despite the ongoing measures implemented to optimize the process of assisting with refugee requests in Roraima, the waiting lines (pre-scheduled appointments) remain long. Therefore, the need to improve the process is continuous, even considering the limitations of human and material resources. This is the research challenge: to identify an emergency solution to improve the process of meeting the disorderly and growing demand, resulting from migratory crises in the border region.

3.2 Stage 2 – Description and Graphical Representation of the Problem Situation

The current situation shows that the Brazilian Federal Police in Roraima has a systematic process to meet demand, process management focused on continuous improvement, and an effort to continuously increase its service capacity, in an attempt to keep up with the growth in demand.

Based on information from the previous stage and the agents' contributions, it was possible to identify problematic situations and their consequences. In this sense, the observed situations and their consequences were described in Table 1.

Table 1

Observed situations and consequences

Observed situation	Comments	Consequences
1. Inability to meet all demands for refugee requests.	The number of employees and collaborators is insufficient to meet the daily demand for refugee requests.	1.1. The service extends beyond the normal hours of operation of the Brazilian Federal Police Unit, in an attempt to meet all requests that are presented at the beginning of the day. 1.2. Applicants remain on the premises of the Brazilian Federal Police for long periods (sometimes all day), waiting for assistance. 1.3. The appointment for service exceeds two months of waiting.
2. Irregular procedure for recruiting personnel to	As it is not possible to meet the demand for refugee requests solely with the public servants or service providers available at the Regional Superintendence/Federal	2.1. The service process is carried out with a lower number than planned. 2.2. There is an overload of work for the servants employed to assist immigrants.

support activities to assist Venezuelan immigrants in Roraima.	Police/Roraima (SR/PF/RR), recruitment of staff members is carried out in other Brazilian Federal Police Units throughout the country. However, there is often a solution for continuity between procedures for recruiting personnel from other units of the federation. The recruited civil servants present themselves after the previous team's service ends.	2.3. Increased waiting time for attending to scheduled immigrants.
3. Lack of personnel qualification.	Some servants recruited to support activities in Roraima have no experience in migration control. They do not have passwords to access information systems or are not trained to operate them.	3.1. The recruited civil servants are not able to integrate the service process, requiring days to be qualified to assume the service stations. 3.2. Reduction in the immigrants' daily service capacity.
4. Lack of control of individual productivity of public servants assigned to assist immigrants.	The number of immigrants served by each employee in the same activity varies widely, due to the employee's personal pace of work and level of qualification and experience in that activity.	4.1. Some servants serve two or three times more immigrants than others. 4.2. There is no parameter to compare the productivity of the public servants, nor a mechanism to assess whether the public servants are using all their work capacity.
5. Insufficient biometric collectors.	All immigrants need to be identified. However, the number of devices for collecting biometric data (currently only three) is insufficient, and they still experience processing failures.	5.1. A bottleneck/retention is created in the identification step, which compromises the flow of the service process. 5.2. Fingerprints and photographs are collected outside the system (papers that must later be digitized and inserted in the identification system).
6. Manual scheduling for attendance.	In Roraima, the scheduling for attendance takes place upon the appearance of the immigrant in the Brazilian Federal Police or through the request for an agenda (reservation of vacancies for attendance) by some support entity for immigrants (Brazilian Army, United Nations High Commissioner for Refugees, Migration and Human Rights Institute, National Migration Registration Card, Federal University of Roraima and Jesuit Mission for migrants).	6.1. Lack of transparency regarding the criteria for scheduling. 6.2. Need for immigrant attendance at the Brazilian Federal Police or intermediation of some entity to obtain a place to attend. 6.3. Difficulty in daily service planning. 6.4. Lack of adequate attention to priority/urgent cases.
7. Lack of integration between databases.	The data for each refuge request is entered into the various information systems used in the process.	7.1. Rework. 7.2. Errors in data entry. 7.3. Failure or inconsistency of the information; information analyzed in a fragmented way.
8. Infrastructure deficiencies.	Interruptions in the supply of electricity in the State of Roraima are constant (Venezuela supplies electricity, and when it is interrupted, thermoelectric plants are activated). System network failures and internet connection interruptions are frequent.	8.1. Despite the availability of power generators, service is still interrupted until the generator starts operating. 8.2. The network and internet outages interrupt the service or make it operate with offline systems.

Based on the adopted methodology, a graphic representation of the situation of interest (rich picture) was developed to explore the central issues related to the process and its most important

elements, the actors and organizations involved, their relationships, and their mental models. The rich picture is shown in Figure 2.

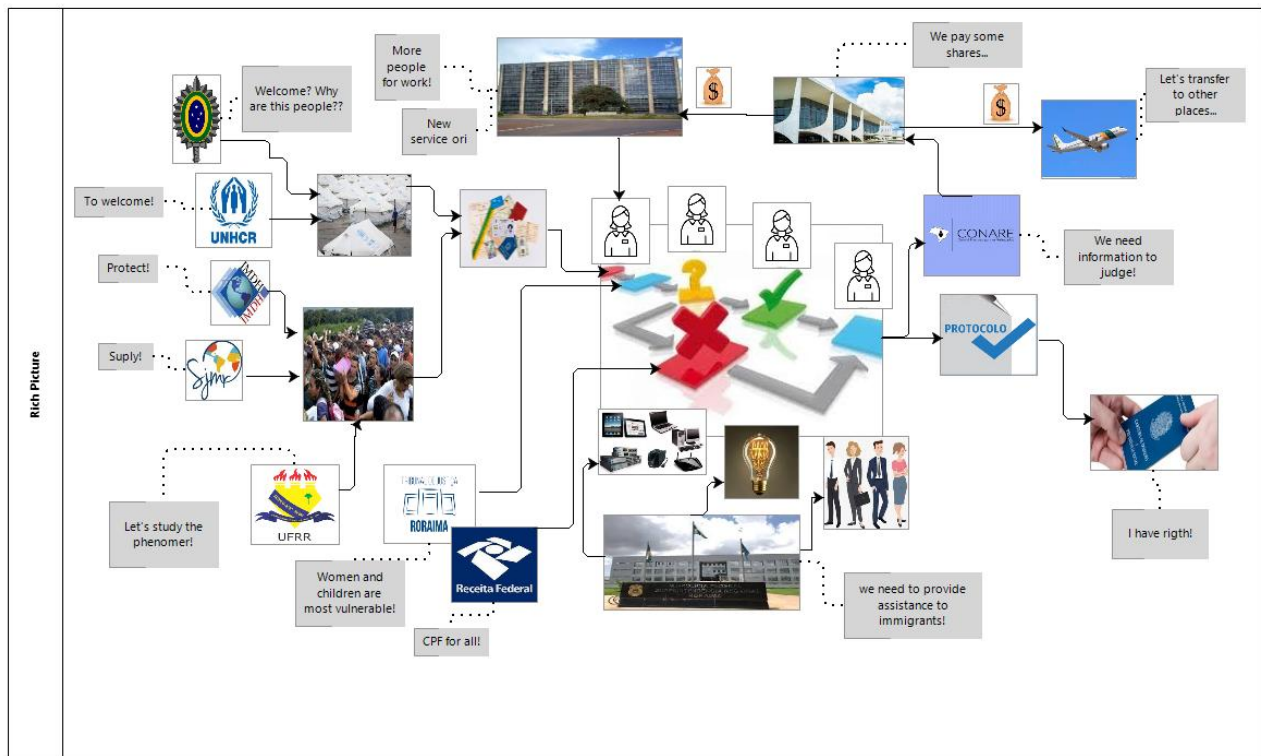


Fig. 2. Rich picture

As shown in Figure 2, the Brazilian Army and the United Nations High Commissioner for Refugees (ACNUR) provide special support to sheltered immigrants, assisting them in preparing and organizing documents to be presented to the Brazilian Federal Police to initiate the refugee application process. Other Civil Society organizations, such as the Migration and Human Rights Institute (IMDH) and the Jesuit Service for Migrants and Refugees (SJMR), also provide pre-service support to Venezuelan immigrants, assisting them in preparing and organizing documents and scheduling appointments with the Federal Police. Researchers and students at the Federal University of Roraima (UFRR) also provide support to immigrants while mapping and studying the Venezuelan migration crisis.

The documents presented by the immigrants are the primary input to the process within the Federal Police. The formalized order protocol is the main output. Throughout the process, emphasis is given to the intervention of the Central Brazilian Federal Police Body in Brasília State (which provides reinforcement of personnel and issues technical guidelines), the Civil House of the Federal Government (which pays for the reinforcement of specific appropriations to assist refugee applicants), Roraima Court of Justice (which supplies documentation and provides direct assistance to vulnerable children and adolescents and immigrant women), the Federal Revenue Service (which registers individuals and informs the corresponding numbers for inclusion in the refuge application protocol) and the Brazilian Federal Police Superintendence in Roraima (which provides the logistics and infrastructure to assist immigrants and manages the process directly).

CONARE/MJ and the immigrant are the main customers in the process. The documents supporting the judgment and declaration of refugee status for the requesting immigrant are sent to CONARE. The immigrant receives the protocol for the refugee request and can already obtain the

Work and Social Security Card and access the entire network of public services and social assistance in Brazil.

3.3 Stage 3 – Selection of Relevant Human Activity Systems

From the problem expressed in the rich picture, some relevant human activity systems were identified, namely:

1. The process of recruiting civil servants from other Brazilian Federal Police units to support the assistance of immigrants, allowing for the correct definition of the daily service capacity, without interruption or discontinuity of service.
2. Training of employees recruited from other units to support the care of refugee requests, allowing them to assess and maintain adequate productivity levels.
3. Availability of an adequate number of biometric data collectors to identify immigrants in the assistance process. The step (photography and digital) is currently the most important bottleneck in the process of responding to refugee requests.
4. The development and implementation of an information system integrated with the databases already available in the Federal Police, which can effectively support the process of responding to refugee requests.
5. Improvement of the logistical structure and infrastructure of the State of Roraima, integrating the State into the national electricity system, and establishing requirements for energy and telephone concessionaires operating in the region.

A root definition was created for each relevant system:

- Relevant system 1: The process of recruiting public servants from other Brazilian Federal Police units, planned and managed by the Executive Board of the Federal Police/Regional Superintendence/Federal Police/Roraima (DIREX/SR/PF/RR), should establish the minimum number of employees to be recruited periodically, appointing the Brazilian Federal Police units that should have the public servants and establish, in advance, the dates of their presentation.
- Relevant system 2: The training system, in person or distance education, must be made available by the General Coordination of Immigration Police (CGPI), in partnership with the National Police Academy (ANP), and required as a requirement for the recruitment of employees designated to assist refugee requests.
- Relevant system 3: Biometric identification system that, through equipment linked to the systems available in the Brazilian Federal Police and in an adequate number, should allow the speed of the data collection procedure and guarantee the detection of fraud and inconsistency in the collected data.
- Relevant system 4: Information system, to be developed by the Brazilian Federal Police Technology and Information Directorate/Federal Police (DTI/PF) and managed by CGPI/DIREX/PF, must be integrated with the databases already available at the Federal Police, to support the entire process of attending refugee requests.
- Relevant system 5: Unlike the others indicated, this system requires decisions in the strictly political sphere. Since it is outside the actors' area of action in this research, this system has been disregarded from this stage onward.

Thus, applying the CATWOE technique – customers, actors, desired transformation, view of the organizational world, owners, and environmental restrictions [13], it was possible to comprehend

the problem situation in general. In this sense, Table 2 summarizes the variables that can interfere in the ideal model subsequently developed.

Table 2

Synthesis of the application of the CATWOE technique

CATWOE element	Relevant system			
	1. Public servants recruitment system	2. Public servant training system	3. Biometric identification system	4. Integrated information system
Customer	SR/RR Immigrant	Public servant SR/RR	Immigrant PF	Immigrant SR/RR PF
Actors	DELEMIG DPF/PAC DIREX/RR SR/RR SEMOB/DGP	CGPI ANP	PPF Public servants	DTI CGPI
Transformation	Regularity of available staff	Training	Bottleneck elimination	Support of the entire process
Worldview	Personnel is input to the service process	Qualification provides speed and efficiency of service	Fast and correct identification is an indispensable condition	Systematization of the process, with safety and agility
Owner	DIREX	CGPI	SR INI	DTI
Environment	Personnel limitation	Public servant resistance	Technical limitation Bidding High cost	High cost Long term Priority

3.4 Stage 4 – Conceptual Model Building (Ideal Model)

In this stage, called key definitions of relevant systems (conceptualization), the ideal model was established. The ideal model served as a basis for comparing systemic thinking (logical analysis) with the real world (cultural analysis). The idea is to enable a new approach to the subject, creating new perspectives and action models for the stated problem.

Initially, based on the contributions of the actors involved in the process, records were made of the improvements that could be implemented to address each problematic situation observed, also indicating which actors could, in principle, implement the required improvements. Table 3 presents the observed situations and areas for improvement.

After a discussion with those involved in the care of Venezuelan immigrants in Roraima, the consensus was reached that the ideal documentation process for Venezuelan immigrants will be one that, at least, makes viable: (1) Insertion of all the necessary information and documentation in the PF immigration system by the interested party, with or without support from organized civil society and United Nations (ONU agencies), at the moment prior to the scheduling of assistance by the Federal Police; (2) Carrying out the biometric identification procedure at each workstation, where corresponding equipment is available; (3) Use of only one information system integrated with the others, in particular the Automated Fingerprint Identification System (AFIS); and (4) Immediate referral of the process for judgment by CONARE in the same information system where all documents in the PF were collected and produced.

Table 3

Observed situations and improvement points

Observed situation	What should be improved?	Who can do it?
1. Inability to meet all demands for refugee requests.	1.1. Establish the number of daily services, considering the number of available public servants (located in the PF/RR and recruited from other units).	DELEMIG DPF/PAC
	1.2. Establish the number of employees to be recruited, considering the time required to carry out each activity of the process and a viable number for recruitment.	DELEMIG DPF/PAC DIREX
2. Irregular procedure for recruiting staff to support activities.	2.1. Plan and formalize the recruitment of personnel, following an annual schedule.	DIREX SR
	2.2. Point out in the schedule which unit of the PF and the date on which it will present public servants to support SR/PF/RR.	SEMOB/DGP
	2.3. Establish a deadline for the presentation of recruited civil servants, considering the closing date of the service order of the active team and eventual need for training of the recruited civil servants.	DIREX SR SEMOB/DGP
3. Lack of personnel qualification.	3.1. Training of employees recruited in the period prior to their assignment to the service.	CGPI ANP
4. Lack of control of individual productivity of public servants assigned to assist immigrants.	4.1. Creation of a performance evaluation, comparing the average times required to carry out each activity.	DELEMIG DPF/PAC
	4.2. Daily productivity monitoring.	DELEMIG DPF/PAC
5. Insufficient biometric collectors.	5.1. Acquisition of an adequate number of equipment, considering the number of public servants in the activity prior to identification (checking of documents) and the time required to carry out the identification of each immigrant.	DELEMIG DPF/PAC (demand quantification) SR (equipment purchase)
6. Manual scheduling for attendance.	6.1. Online agenda, accessible to any immigrant or immigrant support entity.	SR (technology solution with DTI/PF)
7. Lack of integration between databases.	7.1. A single information system or integrated systems that allow immigrants to share data.	CGPI/DIREX DTI/PF

The ideal process consists of providing only information-validation assistance, using biometric identification, and not requiring any subsequent information processing. That is, a complete and efficient service in only one workstation in the PF. Figure 3 represents the ideal process.

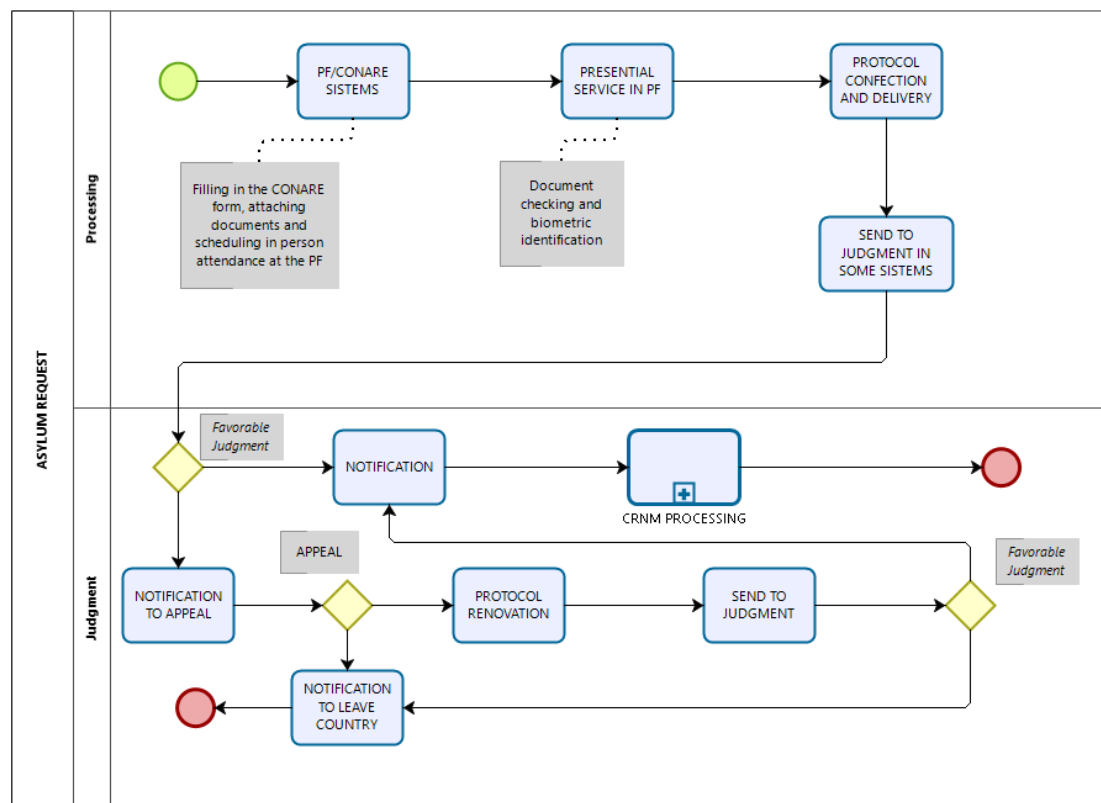


Fig. 3. Ideal process for assisting refuge application

3.5 Stage 5 – Comparison of the Conceptual Model with Reality

Also with the participation of the stakeholders, a comparison was made between the current reality and the ideal model. This comparison enabled the generation of discussion points and potential solutions. Table 4 summarizes the main comparative aspects between the two models discussed.

Table 4

Comparative aspects of service processes: current model versus ideal model

Comparative aspect	Current model	Ideal model
Number of requests answered.	Inability to meet daily demand. Long waiting time for assistance.	Immediate attendance to meet the daily demand for refuge requests.
Public servants	In insufficient numbers and without specific training.	Minimum number of trained public servants required.
Service scheduling	Manual procedure, upon the presence of the immigrant in the PF or request of an assistance entity to the immigrant.	Online scheduling on the PF website, with or without help from organized civil society.
Presentation of documents	Directly at the PF, by the applicant.	Upload on the PF website and just a conference, when attending the PF in person.
Biometric identification	Manually or using insufficient biometric collectors.	Biometric identification equipment at each service station.
Information system	Several systems consulted and used to insert the documents presented and produced in the process.	Integrated information system, to support the entire process and send to CONARE for judgment.

3.6 Stage 6 – Definition of Desirable and Possible Changes

From the analysis of problematic situations, framed in the four relevant systems, the suggested improvement actions were evaluated as changes, according to the desirability and viability criteria, as shown in Table 5.

Table 5

Evaluation of the necessary changes: desirability and viability criteria

Observed situation	Necessary changes	Desirable	Possible
1. Inability to meet daily demands.	1.1. Set the number of daily services, considering the number of available public servants (assigned to PF/RR and recruited from other units).	Yes	Yes
	1.2. Establish the number of public servants to be recruited, considering a viable number for recruitment and the time needed to carry out each activity within the process.	Yes	Yes
2. Irregularity of recruitment.	2.1. Plan and formalize the recruitment of personnel, following an annual schedule.	Yes	Yes
	2.2. Point out in the schedule which unit of the PF and the date on which it will present public servants to support SR/PF/RR.	Yes	Yes
	2.3. Establish a deadline for the presentation of the recruited public servants, prior to the closing date of the service of the active team.	Yes	Yes
3. Public servants without experience or training in the area.	3.1. Training of employees recruited in the period prior to their assignment to the service.	Yes	Yes
4. Lack of productivity control.	4.1. Creation of an individual performance evaluation, comparing the average times required to carry out each activity.	Yes	Yes
	4.2. Daily monitoring of individual productivity.	Yes	Yes
5. Low number of biometric collectors.	5.1. Acquisition of an adequate number of equipment, considering the number of public servants in the activity prior to identification (checking of documents) and the time required to carry out the identification of each immigrant.	Yes	No
6. Manual scheduling.	6.1. Online agenda, accessible to any immigrant or immigrant support entity.	Yes	No
7. Various systems to be fed separately.	7.1. A single information system or integrated systems that allow immigrants to share data.	Yes	No

Thus, improvements to systems 1 and 2 would be desirable and feasible for immediate application, since they are at the system level within the Regional Superintendence of the Brazilian Federal Police in the State of Roraima. Although desirable, the improvements related to the relevant systems 3 and 4 are not initially viable. The acquisition of biometric collectors requires a complex bidding process. The development of a unique information system to support the entire process of responding to refuge requests depends on the actions of the PF Technology and Information Directorate. It implies a high cost and a long timeline to make the system operational, and it still requires overcoming technical limitations.

3.7 Stage 7 – Implementation of the Action to Improve the Problem Situation

At this stage, a plan with the actions was established for the improvements assessed as desirable and possible in the previous stage. Regarding desirable improvements that are not possible at the moment due to existing restrictions, the measures that the Regional Superintendence of the PF in Roraima should adopt to define their implementation at a future time were outlined. The immediate action plan includes:

1. Adoption of a process for recruiting public servants, planned and managed by the Brazilian Federal Police Superintendence in Roraima, in which the minimum number of civil servants to be recruited periodically is established, point out exactly the PF Units that should have the servants (according to logistical and availability aspects) and inform, in advance, the dates of their presentation.

2. Implementation of a training program for PF civil servants, also available to service providers and volunteers of the entities involved in the process of attending to immigrants, in person or distance education, made available by CGPI in partnership with the ANP, which trains designated servants for the care of refugee requests.

Regarding the biometric identification procedure for immigrants, it is clear that making equipment available at each workstation in the short term is not feasible. Currently, in Roraima, there are 16 workstations, of which only 3 biometric identification equipment (bookings) are available from the National Institute of Identification for the State. This equipment is already obsolete in the market, and it is not possible to replace damaged machines or maintain existing ones. Despite this, the biometric identification and comparison of the collected material with information available in databases are essential in both civil and criminal identification.

In view of this, it is incumbent upon the Regional Superintendence of the PF in Roraima to inform INI/DIREX/PF to carry out the necessary bidding process for the acquisition of biometric identification equipment, in order to make available the number of machines necessary to carry out the work in Roraima. Inform the Institute that, until such procedure is completed, collections of biometric material will be carried out outside the systems, for later inclusion by the INI itself (headquarters in Brasília), sharing the risks and losses that the procedure may cause to the security and reliability of the information.

In parallel with such action, the Regional Superintendence may check with the Electoral Justice and ACNUR the possibility of assigning or loaning biometric identification equipment, as it is compatible with the systems operated by the PF.

Regarding the information system itself, although extremely desirable, its immediate unfeasibility remained evident.

It is also the responsibility of the Regional Superintendence of the PF in Roraima to inform CGPI/DIREX/PF, requesting the formalization of the evolution demand of SISMIGRA (immigration system), to give the necessary support to the process of requesting refuge and referral of the process for judgment at CONARE. In this case, design the ideal work process, according to the expectations of the actors involved in assisting immigrants applying for refuge.

4. Discussion

The application of SSM made it possible to identify and describe the problematic situation, select relevant systems, build conceptual models, compare them with reality, and define which changes, viable and desirable, can improve the studied process. Thus, it is intended to present a plan of concrete actions (desirable and feasible) for implementation by the Brazilian Federal Police in Roraima and in other units facing a similar problem: a high volume of refugee requests.

Some of the established actions depend only on decisions at the local level; others require involvement from other instances because they involve more complex issues and entail high costs. Although this circumstance is decisive for the feasibility of the improvements, there will always be actions within the scope of the Regional Superintendence of the Brazilian Federal Police in Roraima that will directly impact the achievement of the objective of increasing the quality of service for refugee requests, even in the long term.

Considering the improvement actions listed in Stage 7, four goals were proposed for the Brazilian Federal Police Unit that meets the demand resulting from the migratory crisis, namely:

1. Adoption of an efficient process for recruiting civil servants to support the demand of refuge requests;
2. Implementation of a training program in the area of migration for PF civil servants and PF employees;
3. Adoption of a fast and secure identification process for the collection of biometric data and identification of refuge requests;
4. Development of an information system that integrates the databases already available in the PF, and supports the process for formalizing refuge applications.

To facilitate understanding of the necessary actions to achieve the established goals, a schematic action plan was developed for each goal using the 5W1H method [29], [30], as shown in Table 6.

The proposed actions were synthesized using a viability balance, prioritizing those that depended solely on PF decisions at the regional level. In the case of a federal public agency (national scope), decisions related to investments and acquisitions require the involvement of Boards, especially when managing information systems (these systems need to be integrated with other systems operating at all decentralized levels). The acquisition of equipment to support actions in all States and the Federal District requires standardization. In this way, all the proposed actions are feasible. The first two goals are already being implemented by the Regional Superintendence of the State of Roraima the adoption of an efficient process for recruiting civil servants to support the demand service for refugee requests, and the implementation of a training program on migration for PF public servants and PF employees.

Although entirely viable, the goals related to adopting a fast, secure identification process for collecting biometric data and identifying refugee applicants, as well as developing an information system that integrates data from multiple databases, require the institution's high-level direction. The regional unit is responsible for making the requested proposals, as suggested in this study.

In view of these complex scenarios, knowledge sharing can contribute to the effective application of the knowledge acquired in the study of the State of Roraima to all other border units of the Federal Police, as happens from an organization to other geographically distant units.

Table 6

5W1H for each goal

Goal 1	Efficient process for recruiting public servants.
WHAT?	Formalize a semiannual recruitment request that meets the needs and continuity of the assistance service for refuge requests at the Unit in which the migration crisis occurs.
WHY?	Guarantee the human resources necessary to meet the requests for refuge, considering the shortage of personnel in the unit in which the migratory crisis occurs.
WHERE?	Formalization of the Order at the recruiting unit (Roraima). Deliberations and control in the Recruitment Sector at DGP/PF (Brasília).
WHEN?	45 days before the presentation of the first team of recruited civil servants. Considering the continuity of the action while the migration crisis lasts. The recruitment process must be repeated every semester, always observing the 45 days prior to the presentation of the first team of the subsequent recruitment.
WHO?	Demanding the Regional Superintendence, specifically by its DIREX, based on a request submitted by the Chief of DELEMIG.
HOW?	The recruitment request will be made every six months, specifying: 1. Minimum number of servants recruited; 2. Minimum frequency of each service order (administrative public servants) or mission order (police public servants) - a reasonable minimum period of 60 days; 3. PF Units definition that should have public servants, according to logistical aspects and staff availability; 4. Schedule for periodic presentation of public servants; 5. Require that the recruited civil servant knows the area of immigration, proven by previous work at DELEMIG or a course certificate in the area.
Goal 2	Training program for PF public servants and PF employees.
WHAT?	Training of PF public servants and PF employees who assist refuge requests.
WHY?	Improve the quality and speed of service for refuge requests.
WHERE?	On the distance learning platform of the National Police Academy. In person at the Regional Superintendence (Roraima).
WHEN?	Period prior to presentation to the service.
WHO?	National Police Academy, Regional Superintendence, through partnerships with Organized Civil Society (especially ACNUR and Federal University of Roraima).
HOW?	Availability of access to courses in the distance learning modality of the ANP to the public servants and employees of the PF (interns, service providers and volunteers). Conducting courses and lectures on the issue of migration and related procedures.
Goal 3	Fast and secure biometric identification of refugee requests.
WHAT?	Acquisition of equipment to collect biometric data and identify refugee requests.
WHY?	Currently, there is a bottleneck in assisting with refuge requests due to an insufficient number of identification equipment units.
WHERE?	Bidding for the acquisition of equipment to be formalized by INI/DIREX (Brasília).
WHEN?	Six months.
WHO?	INI/DIREX.
HOW?	Public bidding under the management of INI/DIREX.
Goal 4	Information system to support the process of assisting migrants requesting refuge.
WHAT?	Development of an information system that can be integrated into the databases available in the PF, including that destined to the biometric identification of the migrant and issuance of the National Migration Registration Card (CRNM).
WHY?	Currently, several systems are used in parallel, which slow down the service process and require rework when feeding the databases.
WHERE?	Brasília - Systems development is the responsibility of DTI/PF.
WHEN?	One year.
WHO?	System development by DTI/PF, on demand from CGPI/DIREX, as contract manager in the area of migration control.
HOW?	Evolutionary demand at SISMIGRA.

5. Conclusions

This study aimed to identify improvements in the process of assisting with refugee applications, which is adopted as a single standard by the Brazilian Federal Police. For this, it was necessary to understand, describe, and analyze the process currently adopted by the Regional Superintendence of the PF in the State of Roraima to meet its growing demand from migrants seeking refuge.

Using the Soft Systems Methodology, proposals were developed to improve the process for refugee requests. The proposals aimed to raise the quality standards of assistance to migrants in border units, enabling more effective responses to emergencies arising during migratory crises. In addition, such actions can be adopted in other units of the PF, where there is a great demand for refugee applications. These units generally require a better use of human and material resources available for the activity.

Faced with complex scenarios, such as the one presented in this paper, knowledge sharing can contribute to the effective application of knowledge acquired during the processing of refugee requests in the State of Roraima across all other border units of the PF. The PF has a process model for assisting refugee requests, supported by normative provisions and procedures defined several years ago. However, the established process does not provide adequate assistance in emergencies, as in the case of the State of Roraima, on the border with a country in economic and political crisis.

Thus, the results of this research improve the process of assisting with refugee applications in the State of Roraima and other border states. The consolidation and systematization of corporate knowledge, along with an emphasis on organizational learning, generate savings in the use of human and material resources, as well as the relevant social impact of more efficient public service provision.

This study has limitations. The search for improvement solutions by the various actors involved has made it difficult to understand, define, and map it, given its dynamic nature. Thus, improvements proposed in the action plan may cease to be feasible or relevant at some point in the future, given the constantly changing reality and processes. Another limitation of the study is the lack of direct participation by immigrants (the primary clients of the process) in developing solutions to improve it. The data were not collected directly from the immigrants, although members of organizations representing refugees and migrants participated in the meetings and interviews. Therefore, the present work does not exhaust the discussion, nor does it aim to provide a complete understanding of the problem or offer an effective and definitive solution to the issues raised. In addition, recent artificial intelligence tools can be adopted in future studies to improve the results [31-39].

Given the complexity of the problem studied, suggestions for future research are presented. It is suggested that the data be collected directly from immigrants and that a manager be assigned to the migration processing workflow to manage demand. Furthermore, documenting the immigration processing workflow, along with all its modifications and evolutions, serves as a foundation for organizational knowledge management.

Author Contributions

All authors conceptualized the study, designed the methodology, conducted the literature review, and synthesized findings into the manuscript. All sections of the paper, including case study analysis, comparative synthesis, and policy recommendations, were written and revised by all authors.

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Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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