

A Critical Insight of the Pope's Visit to Brazil for the World Youth Day: Resilience or Fragility?

Tiago C. de França

PPGI UFRJ

tacruz.franca@ufrj.br

Rafael Lage Tavares

PPGI UFRJ

rlt.rafael@gmail.com

Diogo Nolasco

PPGI UFRJ

diogonolascofs@gmail.com

José Orlando Gomes

PPGI UFRJ

joseorlando@nce.ufrj.br

Paulo Victor R. de Carvalho

PPGI UFRJ

paulov@ien.gov.br

ABSTRACT

This work proposes a model to evaluate systems regarding their resilience in handling unexpected disturbances. To exemplify the use of the proposed model, we chose to analyze the World Youth Day (WYD), an important event on the global scenario that happened this year in Rio de Janeiro, a city which will host big events in the next few years, like the World Cup and the Olympic Games. From this event, we chose two disturbances that stressed the system and had the possibility to cause a lot of problems to the event and the city, like the rains in Guaratiba and the arrival of the Pope's committee. After analyzing how the overall WYD organization deal with these disturbances we conclude that, besides the success of the event, the organization showed much more signs of brittleness than resilience.

Keywords

Resilience Engineering, Resilience Analysis, World Youth Day

INTRODUCTION

Brazil is going to host important events on the global scenario in the next years such as the FIFA World Cup in 2014 and the Olympic Games in 2016. In this scenario of mega events, the Rio de Janeiro city has a spotlighted role, because the city is going to hold the Olympic Games and the final game of the FIFA World Cup.

Some large size events already happened in Rio de Janeiro in 2013. Among these are the FIFA Confederations Cup, the Rock in Rio and the World Youth Day (WYD) organized by the Catholic Church. These events (their planning and what really happened can be analyzed to support a survey to the emergency scenarios that could emerge during the next similar events. From this analysis it was possible to estimate the country capacity to organize and to host big events besides to adapt to changes during these events. The first analyses lead to, in a second time, an inquiry about the resilience or fragility of the country (of the politics authorities, the population and to all involved agents) to cope with unexpected situations.

In this work we analyze some facts that occurred at the WYD 2013. Then the following aspects are analyzed: what was planned, the execution of the initial planning and the disruptions that confronted the event. We have applied a research methodology based on Resilience Engineering (Hollnagel et al., 2006; Hollnagel et al., 2011) principles that allows us to analyze the system resilience or fragility.

The WYD occurred in July and in this work will be considered as the beginning of the event the Pope's arrival in July 22. Officially the event started in July 23, however due to the events that happened during both the pontiff's arrival and population's motion a day before, will be considered the events occurred on the previous day to the official day published by the event organizer.

Some situations analyzed that happens in WYD could have led to the occurrence of a major disasters, especially if there had been some individuals or groups seeking to cause a more severe situation. Even considering that complications in big events with famous persons can be usual situations this case study could help us to understand unusual or unexpected complications that occurred in those situations, and to give us some hints

about how to plan to deal with the unexpected developments.

The major question we address was if in the events that occurred in Brazil during the WYD, the actions taken to cope with the differences between the executed and the planned could be seen as a source of resilience, or there were simple planning failures in a brittle organization?

An analysis about the facts occurred in the WYD, comparing the planning and what was really happened, allows visualizing the event details and then describe aspects that demonstrate resilience (how well the system was able to cope with disturbances in a smooth way) or fragility (what stressed the system to a point that it was not been able to handle easily). The analysis method was based on secondary sources like official information about the planning and from news media (TV, internet and newspapers of Brazil and the world), and in direct observations of the activities in the Centro Integrado de Comando e Controle (CICC) do Rio de Janeiro, and in debriefing interviews with CICC workers. These data have informations about the security planning, logistics and of the developments of events during the WYD.

WORLD YOUTH DAY IN RIO DE JANEIRO

In July 2013, between days 23 and 28, Rio de Janeiro host the XXVIII WYD. The Rio de Janeiro was chosen by the Pope Bento XVI in 2011 in the ending of the WYD that year. However, with the renounce of this Pope in February 2013, the event was conducted by his successor, the Pope Francisco. It was the first meeting of the new pontiff with the catholic youth and the first international event of his pontificate too (WYD, 2013).

A series of events occurred during the WYD, from the arrival of the pope to the transfer of the main stage from one local to another. Table 1 shows the events planned in the event's official site and the planning modifications (change the place of pilgrimage and final mass due to weather conditions).

For the security of the multitude of faithful and of the Pope Francis, the ministry of justice of Brazil employed 6,008 security professionals. The military total number was of 13,723. Until the end of the event, it has not been registered no deaths of pilgrims.

The Pope participated in approximately 20 different activities. All pontiffs' displacements were accompanied in real time by GPS systems and video cameras, plus helicopter pictures and images of the street's video cameras installed by the Rio de Janeiro prefecture.

In a total, 9,787 buses were inspected, which were equivalent to 50% of the entire fleet of the country, 95 of these were detained (Brazilian Federal Government, 2013).

	07-23-2013	07-24-2013	07-25-2013	07-26-2013	07-27-2013	07-28-2013
MORNING	Pilgrims arrive	Catecheses with the Bishops - Grouped according to Language			Pilgrimage to CAMPUS FIDEI - GUARATIBA Changed To COPACABANA BEACH	Final Mass with the Pope CAMPUS FIDEI - GUARATIBA Changed To COPACABANA BEACH
	Vocations Fair - QUINTA DA BOA VISTA					
AFTERNOON	Youth Festival - VARIOUS LOCATIONS				Cultural Activities CAMPUS FIDEI - GUARATIBA Changed To COPACABANA BEACH	Pope's Meeting with Volunteers RIOCENTRO
EVENING	Opening Mass COPACABANA	Youth Festival VARIOUS LOCATIONS	Papal Welcoming Ceremony COPACABANA	Way of the Cross COPACABANA	Vigil of the Pope CAMPUS FIDEI - GUARATIBA Changed To COPACABANA BEACH	

Table 1. WYD's Initial and Changed Program 2013 (WYD, 2013)

Throughout the WYD there have been important moments and events. Some of them required responses to adverse situations occurred. In this paper we analyze two important moments that stress the system in different ways: 1) the Pope caught in traffic jam, and 2) the changing locations of important events due adverse weather conditions.

DESCRIPTION OF THE EVENTS

Pope entourage caught in a traffic jam

When arriving in Rio de Janeiro, the Pope goes on entourage from the Rio de Janeiro airport to the official

reception ceremony which happened at the Guanabara Palace. During the path the convoy was interrupted, because of a traffic jam in one of the major city avenues. In a short time the public got near the car of the Pope while he maintained the windows opened as shown in Figure 1.



Figure 1. Papal convoy stuck in traffic jam

The Rio de Janeiro mayor claimed that the prefecture was working to avoid that the Pope Francis has transit problems again, after the arrival, when he was surrounded by the people in a traffic jam. “The Pope is a traffic jam creator”, joked the mayor, referencing the fact that the pontiff likes to be closer to the people and to be a challenge to the security.

The mayor assumed and divided the fault to the problem in Presidente Vargas Avenue, in July 22, with the federal government. He said “the fails happened, but thank God the Pope has not had real risk”. He also doubted that in another country the Pope would be as well handled in a moment like that. Then he stated “the population of the city proved that they know how to treat the Pope and even protected him”.

Again, in a talk with Pope Francis in the same day, the Pope said to the mayor that “his highest sin is to not follow the security rules”. Raising the question of how to build resilience in these kinds of events, where the people, or the Pope in this case, do not follow the safety rules created against people (and even church) underlying assumptions and culture.

Changed from Guaratiba to Copacabana Beach

Brazilian news published that after months of planning and spending around 130 millions of dollars, a big part of what has been prepared has been taken by the rains. And some of announcements, like the security in Guaratiba made by the army, the 13 kilometers pilgrimage and the transport orientations were removed from schedule. In a press conference in July 25, the representatives of the agencies involved refused to tell what has been spent only in Guaratiba.

According with Brazilian news, the changing in the location of the final mass distorts what has been planned for the event. Every WYD has a pilgrimage. In the case of Rio de Janeiro, the objective was to take the event to a more poor area, and the chosen one was Guaratiba. To rescue the pilgrimage spirit, the Rio de Janeiro prefecture evaluated the blocking of some streets to force the pilgrims to walk more than normal. The idea was discarded and the local organizing committee informed that the vigil and the pilgrimage in Guaratiba were cancelled due to climate conditions (Oliveira, 2013).

The events that happened in Guaratiba cannot be considered surprising. The public ministry of Rio de Janeiro alerted to a series of problems in the organization, concentrated mainly in Guaratiba. To cite just one of them: the risk of overflow of the terrain, in case of coincidence between the rain period and the flood tide, which elevates the level of rivers in the region and impedes the flow of water. The flood tide of July 25 was considered “very high”, with an estimated height of 1.3 meters.

The disposal of the area of 3.5 millions of square meters in west zone, where before only had bushes and where has been created a giant clearing, is an extreme example of the disruptions the system have taken. The vigil and final mass location change, goes beyond the address change: companies were hired and security forces involved needed to move the entire structure to the south zone of the city, causing two days of interdictions and disorders – something that the residents of this area were accustomed, since that zone is where most of the events of the city happen.

The federal government is responsible the public security. In Guaratiba, the preoccupations were protests and pilfering. In Copacabana, the faithful were exposed to the common problems of urban insecurity in a big city. And, of course, makes the lives of protesters easier, because they may move more easily.

“Security authorities do not understand one another about the WYD: representatives of the security state department and the federal police do not sign the document that defines responsibilities of the involved in the event”. This was the statement in the magazine of highest circulation in Brazil that show how important is the interactions between agents in maintenance of a system.

Responsible for security of WYD, representatives of the military, of the military police, civil police and of the municipal and state governments met in July 24, in Rio de Janeiro, to discuss details of the event. The complexity and the size of the event, that had expected number of public of 2 million, challenge the agencies involved in the safety planning. The main discussion was the way to use the command and control systems in the Pope's visit, the masses and the vigil.

The reason beyond the discussion was the difficult to unite the various commands and various police forces in the same area. The representatives of the army, polices, and public agencies do not reached a conclusion about how to operate, simultaneously, groups that act under different offices. For example, in case of an emergency displacement, which one should be activated to where in the city (Oliveira, 2013)?

The problem was related to the activities of public security in Rio de Janeiro. The commander of the first division of the army responsible for the operation of the military in WYD confirmed that the security extraordinary secretariat for big events would need to command the event and the other agencies (Oliveira, 2013).

International Repercussions of events

According with Brazilian news, the arrival of the Pope Francis in Brazil for the WYD reverberated in the international press. The highlights were the unexpected events the occurred during the arrival of the pontiff and the protests that had been repeating for about a month and continued during the arrival. The newspaper New York Times published an article highlighting the problems of the organization of the WYD. Chicago Sun-Times published the following question: “We lost to this?” in the title of an article with a photo of a group of protesters. Similar repercussions occurred in other newspapers in Europe (Griesinger, 2013).

Protests during the WYD

The WYD happened during a wave of civil protests on the city, which was also a risk factor for the organization. To contain the protests, the police intervened. The physical conflict was inevitable in the most encounters. That was what happened with the protest that wore on in front of Guanabara's Palace. The police clashed with the protesters using rubber bullets, tear gas and water cannon, on hour after the Pope's speech. Both sides blamed each other for starting the physical conflict. The police said that they only used force because the protesters were throwing Molotov cocktails on the police. The protesters said the opposite (Terra, 2013).

After that clash, a group of protesters went to the precinct to release members of the Ninja Media, a group of protesters that were broadcasting the protests for the world. The protesters stood there to release those members from Ninja Media, and described that there was a tension in the air. One of them was released and said that the police were not comfortable with the Ninja Media recording inside the precinct, so police officers took their cell phones (Terra, 2013).

Clashes like that occurred all over Brazil, but Rio de Janeiro was in evidence because of WYD and the protesters wanted to take advantage of that to make a bigger impact with their claims. This context needed to be taken into account when planning the WYD, especially for the security of pilgrims and the Pope.

RESEARCH METODOLOGY

This work has as an objective to analyze the WYD event under a resilience engineering perspective, that is, to identify the resilience and fragility or brittleness issues in the actions taken. For this purpose resilience is viewed as a system ability to adapt when confronted with internal and external disturbances during the evolution of some event. Therefore our aim was to understand the adaptations that occur in the system, the ones that lead to a benign behavior as well as the ones that do not lead. To analyze the events that occur in the system we need to cross the normal functioning pattern with the actual functioning. From this crossing we are able to verify the ad hoc adaptations of the system, their results and what could be modified in the case of the events that lead to high risks to the system.

To analyze system resilience we use the model proposed by Woods (Woods, 2006) during the adaptations in the major event of WYD. The resilience model is based in 5 properties:

Buffer capacity: size or kinds of situations that the system can cope or adapt without critically failing in their performance or structure;

Flexibility: system's capacity to restructure itself in response to external events;

Margin: how much closer or farther the system is operating in comparison with performance indicators;

Tolerance: how the system behave in comparison with a performance indicator. Its performance degrades gracefully, as the problem rises or falls down abruptly when the pressure surpasses its adaptive capacity threshold?

Multi-scale or cross-scale interactions:

- Bottom-up: an adaptation problem that affects local actors, propagates to strategic objectives and interactions.
- Top-down: the way that organizational actors solves pressures, conflicts, can generate operational problems.

The method for resilience evaluation was based on those properties. It consists of five categories, each one related with the resilience properties presented: buffer capacity, flexibility, margin, tolerance, and cross-scale interactions. For each existing category, there is a set of questions to be answered according to the system's behavior, given an event or occurrence being analyzed. Table 2 presents the relation of categories and questions in the model.

Categories	Questions
Buffer Capacity	What's the occurrence's size, in comparison to other occurrences? The occurrence's size is enough to break the system? The occurrence's type is a specific one, capable of breaking the system? The occurrence created a fundamental break on the system's structure or performance?
Flexibility	The system restructured itself, given the occurrence? How the system restructured itself, given the occurrence? Which activities were performed for this restructuring happen?
Margin	What is the limit in which the system can be operated given a performance indicator? How close of this indicator, the system currently operates?
Tolerance	When the system is getting closer to its limit, its performance degrades gracefully? When the system is getting closer to its limit, its performance falls down abruptly?
Interaction	The adaptations used by the system's actors exercise a positive or negative influence on the system? The stakeholders facilitate or hinder problem's resolution? How stakeholders' conflicts of interest and objectives influence the system's performance?

Table 2. Questions and categories from the resilience model evaluation

Figure 2 summarizes the activities needed to apply the methodology to any evaluate events. We have applied this methodology to evaluate WYD's events.

ANALYSIS OF KEY EVENTS DURING WYD

First we will analyze the Pope's arrival in Rio de Janeiro, his way from the Antonio Carlos Jobim airport to the major Catholic Church at city. Second, we will analyze the ongoings of WYD in Guaratiba.

Arrival at Presidente Vargas Av.

One of the first events in the WYD, although not a part of the formal/official celebrations, was the arrival of the Pope in Rio de Janeiro in July 22. The papal convoy, which left the Galeão International Airport, in Ilha do Governador, toward the Metropolitan Cathedral, in downtown, got stuck in a traffic jam. This event can be seen as a security breach or an adaptation from an adverse condition? We further analyze based on the evaluation model to discover if the system was resilient or if luck avoided bad consequences.

Buffer Capacity

In this case, there really wasn't an adaptation of the system. Security experts assessed that the situation have exposed the pontiff to danger, once that hundreds of persons surrounded the vehicle (Barrucho, 2013). The system performance dropped to a point where there have been real dangers due to the lack of vision of the papal security occasioned by the nearby vehicles, a situation that can be seen in Figure 1. Looking at the picture is

possible to perceive the risk involved.

Flexibility

We couldn't say that the system restructured itself, there was no alternative route or other transportation means. The system resisted using the very same features waiting for the traffic jam began to flow the to conduct the Pope to his destined location. No activity has been done to restructure the system, the external event ceased and then the system return to its healthy state by itself.

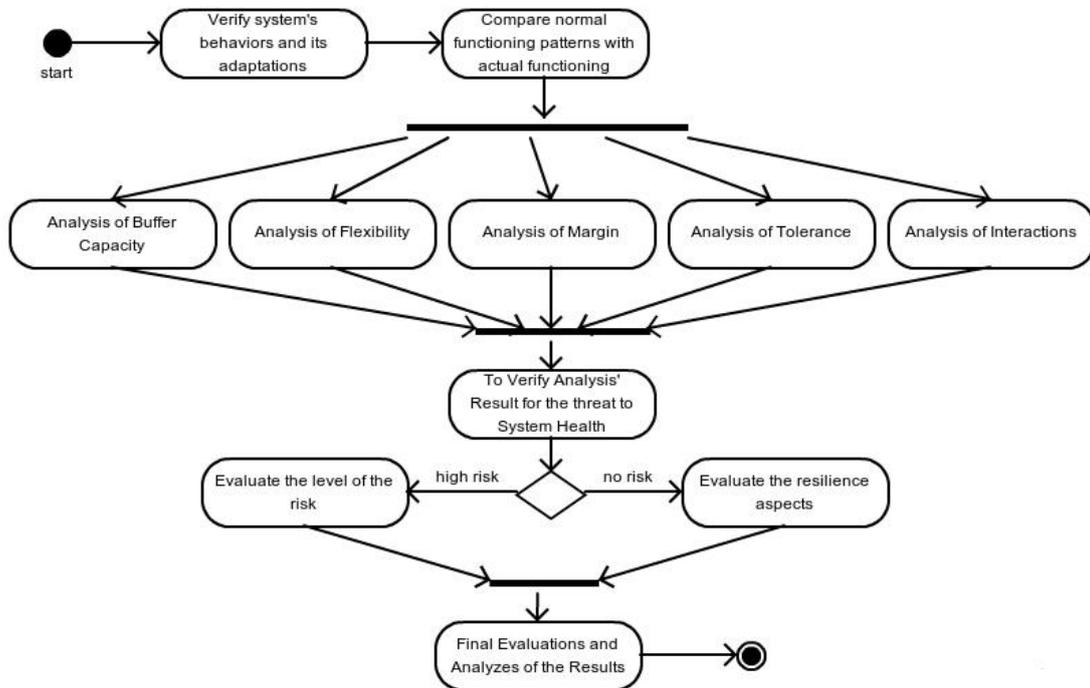


Figure 2. Activity Diagram of the applied the method proposed

This signifies that the system didn't act in a resilient manner, since it was not capable to adjust itself to the situation searching for alternative actions that kept the system safe. Indeed, once it was confronted with the external event there were not any alternatives paths, it lasts trying to keep the same functioning mode while the event lasted. It was an endurance posture.

Margin

The Pope was going downtown and chooses to use one of the routes with the most traffic and people flow in the city, generating huge traffic jams and security issues. The system was put below its performance indicators, if we consider security, public opinion, and transport. The organization could have chosen an alternative route to minimize traffic jams and security issues, or they could interdict the street, causing the traffic jams but minimizing security problems. Neither was done, so the performance of the system in this case was very below any reasonable performance indicator.

Tolerance

Maybe because of the nature of this event and the occurrence, it was not possible to perceive a graceful degradation in the system's performance. As Figure 1 presents, the Pope was being escorted, but the escorts didn't (or even couldn't under such planning) try anything different to enhance the Pope's security, like trying to change the route, making a cordon, among others. Maybe nothing could be done at that time. Anyway, the performance degradation occurred abruptly, especially regarding the Pope's safety.

Cross-scale Interactions

It appears that a problem of communication led the Pope's convoy to that situation. The city mayor said that the fault was due to the Vaticano security, because they chose the route. Later, minister of justice said that there was a communication error between the control center and the prefecture. In this case, there were no conflicts of opinion, because things happened really fast or really covered up. But it is inevitable to say that the communication between the various entities involved in the WYD event has a lot of problems and they influenced in the system's performance in various areas. Even in the CICC the communications observed were

only inside each agency (e.g. commanders of federal police using radios to talk with their filed agents). There was no dedicated information system support to improve the communications and interactions among stakeholders (police, security agents, civil protection, field agents, and so on) to follow the traffic ensuring to take the better itinerary. There are some applications of mobile systems that enable visualizing the traffic flow in the streets that could be used together with more integrated protocols for interaction among agencies. Other works have showed with communications problems (Panitzek et al., 2011; Beneito-Montagut et al., 2013).

Rains in Guaratiba

One of the first on goings of WYD was the rains in Guaratiba, that flooded Campus Fidei, as shown in Figure 3, the place that was supposed to held a group of activities. This occurrence was analyzed given the categories presented before. The model presents questions to each category, which aim to help understand how the system dealt with the occurrence.

Buffer Capacity

The rains in Guaratiba cannot be considered as an unexpected occurrence, because weather predictions were broadcasted that it would rain for the whole week, until Saturday at least and the last religious event happened in Sunday. Even so, the rains did serious damages, causing fundamental problems for the WYD.

Because of the rain, two important moments were cancelled: the vigil and the pilgrimage. The first one was when the congregation spent the night awake in prayer and vigil. The second one was a 13km walk to Campus Fidei. The occurrence did not stop the WYD from going on, but it was not idea, which can mean a point of fragility on the system with respect to the capacity of withstand occurrences with these characteristics.



Figure 3. Campus Fidei in Guaratiba after the rains (Gazeta do Povo, 2013)

Flexibility

To outline the situation, the WYD's organization made the following changes:

- Last Mass' place changed to Copacabana beach
- Pilgrimage's cancellation
- Vigil's cancellation

These changes disappointed a lot of people from different groups. Although the vice president of the organizing committee has said that Copacabana was always the first alternative, he was not satisfied in cancelling pilgrimage and vigil, due to safety reasons. Besides that, since Copacabana was a first alternative and the weather in Guaratiba was predicted for rain until Saturday, it is reasonable to imagine that Copacabana beach would be better prepared to receive the pilgrimage and the vigil.

Those measures also angered other groups of people, like the Guaratiba's tradesfolk, that have prepared to receive the people, buying a lot of products to supply a demand that no longer exists. They were clearly on a financial loss with these changes (Cardili and Alvarenga, 2013).

Margin

Because of the rains, the system was put below its performance indicators, if we consider security, public opinion, budget and public services, especially the transport. As was presented before, the lack of security in conducting the Mass in Guaratiba has made that Copacabana hosted that WYD's activity. This change generated a new security problem, because the place was not prepared to host the event. The budget question was

answered evasively by the Mayor: "It is a joy to receive the Pope here. Let's not make his arrival an accounting game of economic gains. We are receiving a spiritual leader, a head of estate. The Rio de Janeiro has gained a lot, it is very happy to receive the Pope."(Cardili and Alvarenga, 2013).

Tolerance

Maybe because of the nature of this event and the occurrence, it was not possible to perceive a graceful degradation in the system's performance. The reduction occurred abruptly. Regarding safety in Guaratiba, the rains were enough to cancel the Mass. Similarly, they choose not to have the pilgrimage and the vigil on the beach, due to insecurity of the place. So the occurrence did not allow a smooth system performance degradation.

Interaction

This is the most complicated point to analyze, because conflicts of interest exists and are very clear. For example, it is obvious that the tradesfolk from Guaratiba were angered with their financial loss due the change of places for the Mass. Similarly, the Mayor was, apparently under heavy pressure from the WYD's organization committee. According to the press, he said that he would support any decision from the organization committee.

These conflicts influenced the system's performance. It is difficult to say if it was positively or negatively, because it depends of a point of view. From the residents of Copacabana and near locations that had no interest in attending the last Mass, for example, the conflicts influenced negatively, because the choice of the place affected negatively a lot of services in the region. On the other side, for the pilgrims it was great, because a lot of pilgrims should not go to Guaratiba, because it is far, could go to Copacabana beach.

In this case, the rains were forecasted, but the WYD's stakeholders didn't anticipate the change of place. An integrated system information among the public services, meteorological centers and organizers of WYD could be used to improve the exchange of information used by the organizers to take their decision (change or not the place). Other works have showed with communications problems (Panitzek et al., 2011; Beneito-Montagut et al., 2013).

Overview of the Results

An overview of the results can be seen in Table 3. In this table we summarize all analyzes and put our considerations about the results.

An event summary	A summary of results	Authors' Final considerations about results
<p>Pope Francis and his convoy went from Antônio Carlos Jobim airport to Metropolitan Cathedral in Rio de Janeiro. Step by step the events:</p> <ul style="list-style-type: none"> ● The convoy take a different route scheduled; ● Pope Francis stood in the traffic jam; ● Crowds surrounded the Pope's car ● He left the car windows open; ● Security agents could do nothing; ● After some minutes the convoy could leave the jam; ● None accident happened; and ● The failure to execute the planning was attributed to communication problems among departments responsible by traffic and by Pope's safety. <p>We highlight that Brazil was in a moment of intense protests. However, no confrontation happened between pilgrims and protestants.</p>	<p>Buffer Capacity: the pontiff was exposed to danger, since that hundreds of persons seized the vehicle and their security agents could do nothing. The system did not adapt.</p> <p>Flexibility: the cars return to move (external event has changed) then the system returned to its normal state. The system was not flexible, since it was not adjusted by itself.</p> <p>Margin: the organization didn't choose alternative routes to ensure the transport success. Based on some observations, the system had put below its performance indicators.</p> <p>Tolerance: the reduction occurred abruptly, especially regarding the Pope's safety and nothing was done to keep safe the Pontiff.</p> <p>Interaction: communication faults have caused the problem. That has influenced the system's performance. None system information was used to improve the communications among stakeholders.</p>	<p>In this case, the analyses show that, applying the propose methodology, the system has shown all categories (Buffer Capacity, Flexibility, Margin, Tolerance and Interaction) have presented the system's fragility. None good result was perceived. Thus we considered that in general the system was fragile. We also considered that a similar situation could present terrible results in other occasions. For instance, if a president of another country or another famous person was exposed to a crowd, someone could easily injure this person.</p>

<p>Some activities scheduled to happen in Campus Fidei in Guaratiba were transferred to the Copa Cabana beach. Some aspects that need to be highlighted:</p> <ul style="list-style-type: none"> • Guaratiba is a faraway district of Rio de Janeiro downtown; • Its common rains in Guaratiba in this season and previous warnings were given about Campus Fidei; • Activities were changed to happen in Copacabana beach; • Many pilgrims liked of these changes because Copacabana beach is more closer to downtown than Guaratiba; • With the change place, some WYD activities were canceled; • Traders of Guaratiba had many losses because they invested to meet many pilgrims; and • All investment in Campus Fidei infrastructure were lost. <p>On the other hand, big events are frequently realized in Copacabana. Already there is an infrastructure in this place which made it easy prepare the infrastructure necessary for WYD. Although to be a nearby district of downtown, none conflict was registered between pilgrims and protestants in Copacabana.</p>	<p>Buffer Capacity: the rains were predicted, but nothing was done to anticipate the ongoing. Two activities were canceled which was considered a point of fragility on the system because it didn't withstand any occurrences.</p> <p>Flexibility: the WYD's organization made changes to be able to deal with the occurrences. Some people disagreed with those changes mainly traders of Guaratiba. However the pilgrims agreed, because would be easier to go to Copacabana. The system was considered flexible at this point.</p> <p>Margin: Considering the security, public opinion, budget and public services, the system indicators fell in that moment. New problems have emerged (e.g., problems with both spending and security of new infrastructure).</p> <p>Tolerance: the pilgrimage and the vigil were canceled. In this case, the system performance degradation was abrupt. None smooth performance degradation was perceived.</p> <p>Interaction: There were some conflicts of interest that influenced the system's performance. The sudden of local change bothered some residents of Copacabana because a lot of services in the region were negatively affected. But the pilgrims liked, since they found it easier to go to Copacabana than to go to Guaratiba.</p>	<p>Three categories (Buffer Capacity, Margin and Tolerance) have presented bad outcomes. On the other hand, in this case was possible perceive that the system present characteristics of resilience (with caveats) regarding the Flexibility and Interaction. The results were better than the Pope's Arrival Analyses, but it was not good enough. Three categories presented bad result and only two categories showed good partly results.</p>
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Table 3. An overview of the results of analyzes

CONCLUSION

This work applied a model to help analyze a system's resilience. This model presents a group of questions to be answered regarding the system's behavior when handling an occurrence. In order to exemplify the use of this model, we analyzed the WYD, which was a big international event that happened this year in Rio de Janeiro. For this analysis we chose two important occurrences that challenged the system during the event: the arrival at President Vargas Av. and the rains in Guaratiba.

The system's behavior in the arrival at President Vargas Av. showed signs of brittleness, because it puts the Pope in real danger and the organization couldn't do a thing to improve the situation, only hope that the people were not violent neither terrorists. The occurrence wasn't enough to cause a breakdown to the event, but showed signs of brittleness regarding the interactions between different levels of the organization and in terms of flexibility and tolerance in response to the problem.

The system's behaviors in the rains in Guaratiba have showed signs of brittleness, but also signs of resilience. The organization may have waited too long to change the place from Guaratiba to another one, and they may have not chosen the ideal place to substitute. This caused in dissatisfaction from all kinds of groups of people involved: tradesfolk from Guaratiba, residents from Copacabana and the Pope's committee. And even if it has not caused a total system breakdown, two important activities were cancelled because the new place did not have the safety requirements. However, this cancellation may hint to certain resilience, because they chose to cancel the activities to improve security. In other words, they chose to lose on one end (people's satisfaction) to win in another end (improving security).

As a result, we concluded that the model for analyzing resilience can be an important tool to help people and organizations to understand and analyze its own events and learn from it, improving the resilience in future opportunities. We can also conclude that the model can be used to analyze two kinds of events: crowd control,

as in the arrival at Presidente Vargas Av. and natural hazards, such as the rains in Guaratiba. So we can hope that the model could be used to analyze other types of events. But we can't say for sure as new studies are needed.

There are a lot there is still much to do to improve the model and analyzes, such as: analyze other events, ask to specialists to do those analysis and gather their feedback, create a social media tool to help analyzing the events using the public opinion. Also as a future work one could extend the model to create a maturity model on resilience.

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