

# USAGE OF MULTICRITERIA ANALYSIS TO REDEFINE JUDGMENT CRITERIA MODEL FOR RIO DE JANEIRO'S CARNIVAL

Jose Fabiano da Serra Costa\*  
Rio de Janeiro State University (UERJ) - Brazil  
E-mail: [fabiano@ime.uerj.br](mailto:fabiano@ime.uerj.br)

Bruno Barros da Silva  
Rio de Janeiro State University (UERJ) - Brazil  
E-mail: [prof.brunobarros@gmail.com](mailto:prof.brunobarros@gmail.com)

Carolina Galdino Ramalho  
Rio de Janeiro State University (UERJ) - Brazil  
E-mail: [anabiars@yahoo.com.br](mailto:anabiars@yahoo.com.br)

## ABSTRACT

This article is focused in a multicriteria analysis concerning the criteria used to judge Schools of Samba in the Special Group of Rio de Janeiro's Carnival. Nowadays, the Schools of Samba parade is entitled the greatest show on Earth, mostly due to the fact that these Schools are becoming more and more professional, heading to better results. Also, LIESA – the Independent League of Schools of Samba – has been trying to improve the judgment, making it more fair e straight. As an example, we point out the fact that in the last 30 years the rules have changed 22 times. In this article, we intend to present a new judgment method, adding to each aspect priorities to its criteria.

Keywords: Schools of Samba, Multicriteria, Carnival

## 1. Introduction

One of the most important popular expressions of Brazilian culture is samba. After almost one century of existence, the Schools of Samba Parade keeps its vitality. The parade is continuously adapting to world's constant transformation, adjusting itself to reality and enhancing every year. This phenomenon has resisted to innumerable changes, like charging fees to watch the show, various changes in presentation places, censorial control due to political reasons, regulations updates (excessively made in the first years of the show) and professionalization of the responsible people for the parade execution, among others.

Judgment categories are extremely important to increasing quality of presentations, since it is according to those categories that schools invest in search for perfection and creativity, making the dispute harder each year. So, aiming for the perfect standards, the judgment regulations have been transformed since their creation (SAMBA, AMOR e TRADIÇÃO, 2010).

In this work, we will use a multicriteria methodology for decision support attempting to create a modern and coherent judgment model for the schools of samba parade. Also, we will present an example of this application, analyzing a comparison of a simulated judgment using the proposed model and the existing one.

---

\* Corresponding author

## **2. The importance of Carnival**

The Rio de Janeiro Schools of Samba Parade is a world scale feast. Thousands of Brazilians and foreigners tourists visit *Sambódromo* – the especially designed parade runway – and over 180 countries receive television transmission images of the parade. Rio de Janeiro's Carnival involves over 500 million dollars e generates around 83 thousand direct and indirect jobs , according Riotur (2010) data.

The work involving Carnival takes place all over the year. Not only preparing the parade itself, the Samba Schools also develop social, sports and educational projects within the communities they belong to. The dispute among the Schools is intense, which is supported by a judgment method and a regulation that have been constantly evolving since the begging of the existence of schools of samba. In the last 30 year, the rules have changed 22 times, considering adding and subtracting categories, introduction of time controlling, differentiated pondering, choice of judges, penalties, uneven criteria, forms and number of access and demotions.

Nowadays, the Samba Schools are judged according ten categories evaluated by the Judgment Commission chosen by the League of Independent Schools of Samba – LIESA, the organism that coordinates the parade for the last 25 years: Percussion, Samba-Plot (subdivided into Lyrics and Music), Harmony, Evolution, Theme, Joint, Allegories and Props, Costumes, Vanguard Commission, Master of the Room and the Lady with the Flag (LIESA, 2010). The judges must answer a questionnaire giving grades from 7 to 10, based on the regulations, penalties guidelines and explicit definitions of what should or should not be taken into consideration. So, to properly prepare the judges there are training courses organized by the coordination institution.

Despite all that work to achieve standardization in judgments, the harder disputes, the intense effort to improve schools qualifications and discrepancy in judgments have aroused controversy over the last results. In this article, we propose a model that keeps the subjectivity of the analysis and incorporates objective elements in judgments.

## **3. Multicriteria analysis**

AHP is one of the most widely spread and utilized decision making methods, having diverse applications in several branches of industry, government and general services. The method is basically grounded in a pair comparison of relative importance of attributes. There are several alternatives to aggregate specialists opinions and many of those provide values very close to consistency (SAATY & PENIWATI, 2007; SAATY, 2005; COSTA & BELDERRAIN, 2009; GOMES et al, 2004; ESCOBAR & MORENO-JIMÉNEZ, 2007), in such a way that reciprocity and transitivity properties are maintained.

According to Saaty (1991), a matrix which elements are non-negative and reciprocal, and to which transitivity properties are valid, presents its maximum eigenvalue with value equal to the matrix order (N). However, the presence of inconsistency in pair judgments may cause intransitivity to this matrix. Therefore, the use of Consistency Reason (CR) allows evaluating the inconsistency regarding the order of judgment matrix. The closest the CR is to zero, the more consistent is the matrix.

## **4. The model**

Based on the instructions given to LIESA judges, this study is divided in 11 separated parts, each part representing a judgment category of the Schools of Samba parade, considering that Samba-Plot is subdivided in Lyrics and Music. An independent analysis was made to each category, so, each analysis had its particularities such as the number of criteria varying from 3 to 6, depending on the category.

The next step was to consult a group of twenty specialists, being half of that number of people indicated by LIESA and the other half by journalists specialized in Rio de Janeiro's carnival. Malhotra *et al* (2007), pointing out the importance of identifying and distinguishing properly the specialists in a decision model, affirmed that the decision quality is directly related to the knowledge of the specialists about the subject.

As the categories are judged with grades from 7.0 to 10.0, considering decimal numbers, the range of punctuation is 30 decimal points. The maximum number of decimal points which may be discounted when judging criteria for each category will be the weight value multiplied by 30, as in Table 1.

Table 1. Discount range for the criteria.

<b>Category: Percussion</b>	<b>Descontos</b>
Regular maintenance of drums rhythm in consonance with the samba	1 -12
Perfect conjugation of sounds emitted by various instruments	1 – 10
Creativity and versatility of battery	1 – 8
<b>Category: Samba-Plot / Lyrics</b>	<b>Descontos</b>
Adequacy of the lyrics to the plot	1 – 5
Poetic richness, beauty and good taste	1 – 5
Objectivity and clarity, disregarding grammar discipline	1 – 2
Adaptation to music	1 – 3
<b>Category: Samba-Plot / Music</b>	<b>Descontos</b>
Samba's proper rhythmic characteristics	1 – 5
Musical richness, beauty and good taste of its musical design	1 – 4
Capability to use musical harmony to facilitate singing and dancing of the performers	1 – 6
<b>Category: Harmony</b>	<b>Descontos</b>
Perfection in equally singing of samba-plot	1 – 12
All the schools' participants singing the samba-plot	1 – 9
Samba harmony	1 – 9
<b>Category: Evolution</b>	<b>Descontos</b>
Fluency of the presentation	1 – 11
Spontaneity, creativity, vibration and agility of participants	1 – 7
Cohesion of the parade, uniformity of the spaces between the groups	1 – 12
<b>Category: Theme</b>	<b>Descontos</b>
General development of proposed theme	1 – 9
Guidance, sequential development of the parts (groups, allegories, fantasies)	1 – 6
Capability of comprehending the theme from its association with the concept	1 – 11
Creative (different from inedited)	1 – 4
<b>Category: Joint</b>	<b>Descontos</b>
Uniformity in ways of expression regarding size of the groups	1 – 4
Uniformity in ways of expression regarding clothing quality	1 – 5
Uniformity in ways of expression regarding succeeding visual elements	1 – 7
Uniformity in ways of expression regarding rhythmic and musical balance	1 – 5
Uniformity among the ways of expression (musical, rhythmic and visual)	1 – 9
<b>Category: Allegories and Props</b>	<b>Descontos</b>
Conception and adequacy of allegories and props to the theme	1 – 13
Impression caused by forms and relations	1 – 7
Finishing and care in confection and decoration	1 – 5
Composition figures, complementing allegories	1 – 5
<b>Category: Fantasy</b>	<b>Descontos</b>
Conception and adequacy of fantasies to the theme	1 – 16
Impression caused by forms and relations	1 – 4
Finishing and care in confection	1 – 5

Uniformity in details	1 – 5
<b>Category: Vanguard Commission</b>	<b>Descontos</b>
Fulfilling of the main function: greet the public and present the school	1 – 10
Coordination, tune and creativity in the exhibition	1 – 9
Vanguard Commission’s Garments	1 – 4
Adequacy to the theme: introducing it, announcing it or summarizing it	1 – 7
<b>Category: Master of the Room and the Lady with the Flag</b>	<b>Descontos</b>
Couple’s dance exhibition	1 – 7
Couple’s harmony	1 – 7
Master of the Room’s function	1 – 6
Lady with the Flag’s function	1 – 5
Fall or loss, even accidental, of part of the garment	1 – 3
Couple’s garment	1 – 2

## 5. Example

For the purpose of the examples, three fiction schools will be considered: Unidos de Santa Rosa, Acadêmicos do Rancho, Império da Zona Norte and Independentes de São Miguel.

### 5.1 Example 1

In the category Allegories and Props, during the exhibition of Unidos de Santa Rosa, one judge observed that the school presented flaws in finishing the allegories number 3 and 6, and decided to discount nine decimal points (score 9.1). When Acadêmicos do Rancho was on the runway, the judge found flaws in finishing two allegories, the opening car and in 4<sup>th</sup> allegory, however he decided to reduce only two decimal points in school score (score 9.8). Consider that these were schools’ only flaws in this category. In this example, it is easy to notice a discrepancy in judgment, since the flaws of both schools were very similar and the discount applied was significantly different. It is important to point out that when a judge discounts any decimal point, he has to write a justification. Table 2 summarizes the discounts given.

Table 2. Discounts in Allegories and Props using existing model.

School	Discounts in decimal points			
	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>
Santa Rosa	-	-	9	-
Rancho	-	-	2	-

Using the proposed method, this difference would be diminished, because, as shown in Table 1, the allegory category could have a maximum discount of five decimal points. So, the seven decimal points difference between the two given discounts would be reduced to three decimal points, as show in Table 3.

Table 3. Discounts in Allegories and Props using the proposed model.

School	Discounts in decimal points							
	Existing model				Proposed model			
	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>
Santa Rosa	-	-	9	-	-	-	5	-
Rancho	-	-	2	-	-	-	2	-
Difference	-	-	7	-	-	-	3	-

### 5.1 Example 2

The dispute among the Special Group’s Schools of Samba is decided by decimal points. Therefore, we also suggest that each discount interval for the criteria in the categories should be divided in two levels,

minor and severe. So, a judge would have to justify the intensity of the occurrence of the flaw he noticed. As an example, considering the proposed method used in Example 1, in category Allegories and Props, the judge considered that, during Império da Zona Norte’s parade, there was a problem in colors combination in the opening car, making the allegory confusing. That problem resulted in a five decimal point discount for the school. In Independentes de São Miguel parade, the judge noticed that six of the eight allegories presented some sort of colors and materials combination flaws, and discounted the maximum allowed, that is seven decimal points, as shown in Table 4. Also in this case, consider these were the only flaws for the category.

Table 4. Discounts in Allegories and Props using proposed model.

School	Discounts in decimal points			
	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>
Império	-	5	-	-
Independentes	-	7	-	-

The judgment seems fair when considering that Independentes de São Miguel having the higher discounts. However, when considering that Império da Zona Norte committed that same mistakes that Independentes de São Miguel, in a very lighter way, Império should have had lower discounts. Therefore, considering the idea of dividing the discounts in two levels, Império da Zona Norte, which committed a minor flaw, should not be penalized in more than three decimal points (the division of the seven decimal points allowed to the criteria of this category in two levels), according to Table 5.

Table 5. Discount range for the Allegories and Props criteria.

Criteria	Discount in decimal points	
	Minor	Severe
E <sub>1</sub>	1 - 6	7 - 13
E <sub>2</sub>	1 - 3	4 - 7
E <sub>3</sub>	1 - 2	3 - 5
E <sub>4</sub>	1 - 2	3 - 5

The change might not seem very intense, but the difference in discount between the two schools doubles, as presented in Table 6.

Table 6. Discount comparison in Category Allegories and Props using originally proposed model and two level model.

School	Discounts in decimal points							
	Proposed model				Two Level Proposed model			
	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>	E <sub>1</sub>	E <sub>2</sub>	E <sub>3</sub>	E <sub>4</sub>
Império	-	5	-	-	-	3	-	-
São Miguel	-	7	-	-	-	7	-	-
Difference	-	2	-	-	-	4	-	-

## 6. Considerations

New technologies will be always useful, as long as they are simple to comprehend and justified to be used. AHP used to create a new evaluation model presented itself both effective and easy to apply. The use of carnival specialists’ opinion is a necessary tool to the success of the model. With the achieved results in the examples, one can notice that it is possible to reach for enhancement in quality for Rio de

Janeiro's Schools of Samba judgment categories, considered the increasing importance of the event every year and the amount of money involved, which generates tourism, leisure and fun, as well as employment.

With the presented examples, it is easily observed the need of a new evaluation form, providing the discount ranges for each criterion in the categories, to help the judges in their function. It is important to highlight that, when defined discount ranges for the categories' scores, the intention is not suppressing the subjectivity of the judge, but only minimizing the occurrence of possible mistakes or discrepancies in judgment. Each judge keeps the liberty of noticing, discounting and justifying any flaws. The model proposes that, as long as a flaw is justified, the discount must be applied according to the justification.

Also worthy noticing that the model does not assure the perfection of judgment, considering it is a tool to be combined with others, for example, the investments in effective training for the judges, since a structured discount method will only be useful if the judge is able to discern what should be discounted. This study intends to stimulate the discussion over a present and important theme, and does not mean to be definitive about it. However, it is fundamental to continuously develop models that use a toolkit based on technical and academic learning, attempting to propitiate improvements in diverse society areas.

## REFERENCES

- Costa, T. C., Belderrain, M. C. N. (2009). Decisão em Grupo em Métodos Multicritério de Apoio à Decisão. Anais 15o Encontro de Iniciação Científica e Pós-Graduação do ITA.
- Diniz, A. (2008). Almanaque do Carnaval - A História do Carnaval, o que Ouvir, o que Ler, Onde Curtir. Editora Jorge Zahar, RJ.
- Escobar, M. T., Moreno-jiménez, J. M. (2007). Aggregation of Individual Preference Structures in Ahp-Group Decision Making. Group Decision and Negotiation, Volume 16, Number 4, Springer.
- Liesa. Manual do Julgador. Available at <http://liesa.globo.com> . Access in 2010.
- Malhotra, V. A., Lee M. D., Khurana, A. (2007). Domain Experts Influence Decision Quality: Towards a Robust Method for their Identification. J. of Petroleum Science and Engineering, 57.
- Riotur – Carnaval. Available at: <http://www.rio.rj.gov.br/web/riotur/>. Access in 2010.
- Saaty, T. L. (1991). Método de Análise Hierárquica. Rio de Janeiro: Makrom Books, 2Ed.
- Saaty, T. L. (2005). Theory and Applications of The Analytic Network Process: decision making with benefits, opportunities, costs and risks. Pittsburg: RWS.
- Saaty, T. L., Peniwati, K. (2007). Group Decision Making: drawing out and reconciling differences. Pittsburgh: RWS Publications.
- Samba, Amor e Tradição - História do Carnaval Carioca. Available at: [www.samba-choro.com.br/s-c/tribuna/samba-choro.0407/0333.html](http://www.samba-choro.com.br/s-c/tribuna/samba-choro.0407/0333.html). Access in 2010.