

STUDENT PERFORMANCE INDICATORS AT THE TECHNOLOGICAL INSTITUTE OF VILLAHERMOSA AND THEIR EFFECTIVENESS IN THE ACADEMIC PROGRAMS.

STUDENT PERFORMANCE INDICATORS AT THE TECHNOLOGICAL INSTITUTE OF VILLAHERMOSA AND THEIR EFFECTIVENESS IN THE ACADEMIC PROGRAMS

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<https://doi.org/10.61117/ipsumtec.v7i2.329>

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Abstract -- The project was carried out at the Instituto Tecnológico de Villahermosa with the objective of identifying the indicators that measure the academic, personal and professional performance of students, as well as the causes of school dropout, in the students of the Instituto Tecnológico de Villahermosa.

The methodology included the collection of data through online forms, such as Google Forms, facilitating the participation of a total population of 4,753. In order to obtain representative results, simple random sampling was applied, which guaranteed that each student had the same probability of being selected. A confidence level of 95% and a margin of error of 5% was established, which made it possible to determine that the sample needed for the survey was 355 students; this project was quantitative and descriptive in nature.

Various evaluation indicators were identified, such as written exams, oral exams, projects and presentations, which allow measuring academic performance in a comprehensive manner. In addition, a SWOT analysis was conducted to better understand the factors that influence school dropout.

The results obtained revealed that the diversity of evaluation indicators is crucial to verify the scope of the qualifications and that the lack of formats to evaluate transversal and professional skills is a significant problem. Likewise, factors such as lack of academic and personal support, as well as economic problems, were identified as contributing to dropping out of studies.

Keywords-- Academic performance, School dropout, Evaluation indicators.

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INTRODUCTION

Higher education plays a fundamental role in the personal and professional development of individuals, as well as in the social and economic progress of a nation. In this context, the Instituto Tecnológico de Villahermosa stands as a key institution in the training of professionals in various areas of knowledge.

Higher education is essential for the personal and professional growth of individuals, in addition to being an engine for the social and economic development of a country. Within this framework, the Instituto Tecnológico de Villahermosa stands out as a fundamental institution in the training of professionals in multiple disciplines. However, despite its commitment to educational excellence, it faces significant challenges, among which the increase in school dropout rates and the need to effectively evaluate the academic performance of its students stand out.

[1] Dropping out of school is a complicated issue that can be influenced by multiple factors, including lack of motivation, economic problems, academic difficulties and lack of institutional support. This problem not only affects students who drop out, but also has repercussions on the quality of education and the reputation of the institution. Therefore, it is essential to investigate and understand the causes of this phenomenon in order to implement strategies that promote retention and academic success.

The present project is framed within the need to address academic performance and school dropout at the Instituto Tecnológico de Villahermosa, a higher education institution that faces significant challenges in the formation of its students. Over the years, an increase in the rate has been observed, which raises questions about the quality of education and the well-being of students. This phenomenon not only affects students, but also impacts the institution and its ability to train competent professionals in various areas of knowledge.

In this sense, the main objective of this project is to investigate the indicators that allow measuring the academic, personal and professional performance of the students of the Instituto Tecnológico de Villahermosa. Through a comprehensive approach, it seeks to identify and analyze these indicators, as well as the factors that contribute to school dropout. The identification of these elements is crucial to develop an evaluation framework that not only reflects academic performance, but also promotes the development of transversal skills and the well-being of the student community.

The following specific objectives were developed to carry out this project:

Objective 1: Identify key indicators that affect student academic performance at ITVH. Objective 2: Evaluate the effectiveness of academic programs in relation to performance indicators.

Objective 3: Propose recommendations for improving academic programs based on performance indicators.

The goal is not only to improve the quality of education at the Instituto Tecnológico de Villahermosa, but also to contribute to the creation of a more enriching and motivating educational environment. By addressing these challenges, it is expected to generate a positive impact on the academic experience of students and on the competitiveness of the institution in the current educational context.

This project is based on the category of having a comprehensive approach to effectively evaluate student performance. By improving the quality education and promoting an enriching educational environment, it seeks not only to benefit students, but also to strengthen the competitiveness of the institution in the current educational context. Therefore, it is presented as an opportunity to generate a positive impact on the academic experience of students and the quality of education offered by the Instituto Tecnológico de Villahermosa.

DEVELOPMENT

Theoretical framework:

[2] Student dropout is a complex phenomenon resulting from a series of diverse factors, which has given rise to multiple theoretical approaches to the subject. Initially, models and theories seeking to analyze this phenomenon focused on investigating the academic, socioeconomic, psychological and family characteristics of students entering higher education.

Models and Theories on Dropout and Academic Achievement

Since both dropout and academic performance are complex and multifaceted problems, researchers have developed several theoretical models to better understand these phenomena:

Theory of Academic and Social Integration.

[3] This theory posits that the integration of students into the academic and social aspects of the institution is crucial to their retention. Those students who feel fully integrated into the university community and receive adequate support are more likely to stay in college and succeed academically.

[4] academic integration, facilitated through participation in tutoring, study groups, and class attendance, plays a key role in student retention. AI encourages a environment from support and

collaboration, these activities not only improve academic performance, but also promote a sense of belonging and commitment that is essential for students to continue at the university.

Expectations and Value Model.

[5] This model establishes that students' decisions, including those related to dropping out of their studies, are conditioned by their expectations of success and the value they attribute to their academic activities. Elements such as personal interest, the perceived usefulness of the course and the associated cost (both economic and emotional) play a fundamental role in these decisions.

Self-Determination Theory

[6] This theory emphasizes the importance of both intrinsic and extrinsic motivation in student retention and academic performance. Students who are intrinsically motivated, i.e., who have a genuine interest in their studies, tend to persevere more and achieve higher levels of academic success.

[7] The dropout phenomenon impacts various academic programs through different modalities (face-to-face, virtual and distance) and educational levels (undergraduate, technical and technological). This phenomenon is deeply influenced by high student dropout rates. Dropout is understood as the early interruption, whether voluntary or involuntary, of the course in which a student has enrolled. Regardless of the reasons behind this dropout, the problem has captured the attention not only of higher educational institutions, but also of educational authorities and the general public.

[8] How to prevent school dropout?

Combating school dropout requires a comprehensive approach that addresses all the underlying factors that cause it, such as poverty, social exclusion, drug addiction and delinquency. This task is not simple, but some effective steps include:

- **Foster a supportive educational environment:** Ensure that students have access to adequate resources, well-maintained classrooms, committed teachers, and an environment free from harassment and other harmful interactions.
- **Offer integration opportunities:** Implement flexible educational programs such as evening classes, adult education, academic development plans, scholarships, and study grants.
- **Invest in public education:** Especially in developing countries, it is essential to provide basic resources for study, such as food, by investing in education.

quality public education that provides opportunities at no cost to needy students.

- **Support international aid programs:** Utilize resources from international institutions and sponsors that work to prevent school dropout, as long as adequate information is available to access them.

The MEFI matrix

[9] Internal Factor Assessment matrix evaluates the company's internal information.

This is done through an internal audit identify Strengths and Weaknesses.

This is directly related to the direction, organization, control and planning of the organization.

Academic Performance in Higher Education

[10] Academic achievement is another critical factor that requires attention in higher education. Performance is not only measured in terms of grades or academic success, but also encompasses the development of cross-cutting skills and preparation for the professional world.

1. **Academic Performance Indicators:** These include written and oral examinations, projects, exhibitions, and participation in academic and extracurricular activities. Evaluating these indicators in a comprehensive manner allows for a better understanding of students' overall academic performance.
2. **Performance Improvement Strategies:** It is essential to analyze the effectiveness of current academic programs with regard to
3. **performance indicators.** This involves evaluating teaching methods, the relevance of curricular content, and the academic support available to students.

Methodology

The project was carried out at the Instituto Tecnológico de Villahermosa (ITVH) with the objective of identifying the indicators that measure the academic, personal and professional performance of students, as well as the causes of school dropout, using the MEFI method (Matrix for the Evaluation of Internal Factors).

Type of Research

[11] The research was quantitative and descriptive. This type of research focused on the collection and analysis of numerical data to describe characteristics and evaluate the academic, personal and professional performance of students, as well as to identify factors that contribute to school dropout.

Research Approach

The research approach was **descriptive**, as it focused on describing in detail performance indicators and factors. In addition,

[12] **The MEFI** (Matrix of Evaluation Internal Factors) method was applied to systematically evaluate the internal elements that affect the performance and permanence of students in the institution.

Tools Used to Identify Indicators

The following tools were used to identify performance indicators and causes of school dropout:

1. **Online Forms (Google Forms):** These were used to efficiently collect data and facilitate student participation. These forms allowed obtaining information on academic performance indicators (written exams, oral exams, projects and exhibitions) and factors affecting school dropout.
2. [13] **SWOT (Strengths, Weaknesses, Opportunities, Threats, and Opportunities) Analysis:** This tool was used to identify and analyze the internal and external factors that influence academic performance and dropout. The SWOT analysis helped to better understand the internal strengths and weaknesses, as well as the external opportunities and threats faced by students.

Diagram 1. SWOT Matrix

Weaknesses	Threats
Resource Educational Insufficient (40%)	Attrition due to economic problems, lack of support academic: 25% (problems economic), 20% (lack of support), 30% (professional skills)
Deficiencies at the Integration of Abilities Professionals (30%)	Competition Other Institutions Educational wit
-Support Academic Insufficient Personne l (20%)	Changes in the Requirements of Labor Market
	Impacts of Technology and Teaching Methodologies

Population and Sample

The total population of the study was **4,753 students enrolled** at the Instituto Tecnológico de Villahermosa. In order to obtain representative results, a **simple random sampling** was applied, which guaranteed that each student had the same probability of being

selected. With a confidence level of **95%** and a margin of error of **5%**, the sample needed for the survey was determined to be **355 students**.

Diagram 2. SWOT Matrix

Strengths	Opportunities
High Rate from Approval General Improvement in Educational Resources (85%)	
Quality of Personnel Development Skills (90%)	from Teaching Transversal
Structure Structure Strengthening Standards (25%)	from Support Aligned with Emotional and Financial
	Innovation at Methods Teaching Methods

Information Gathering

Data collection was carried out as follows:

1. **Online Forms Distribution:** The forms were distributed to randomly selected students through digital platforms such as Google Forms. This tool facilitated data collection in a quick and effective manner, allowing students to participate from anywhere and at any time.
2. **Application of Surveys:** The surveys included questions on the different evaluation indicators, such as written and oral exams, projects and exhibitions, as well as questions on academic and personal support received, and economic problems that could be influencing school dropout.
3. **SWOT analysis:** The SWOT analysis was used to evaluate the internal and external factors affecting student performance and dropout. This tool allowed for a deeper understanding of the individual and collective circumstances of the students, identifying key factors that affect their academic and personal performance.

Analysis Results

The results obtained showed that the diversity of evaluation indicators is crucial to measure academic performance in a comprehensive manner. However, a significant lack of formats to assess cross-cutting and professional skills was also identified. In addition, several factors were found to contribute to school dropout, such as lack of academic and personal support, and economic problems. With these results, the Instituto Tecnológico de Villahermosa can develop more effective strategies to improve academic performance and reduce school dropout.

addressing both assessment indicators and student support and personal development factors.

Application of the MEFI Tool (Internal Factor Evaluation Matrix).

The MEFI tool (Matrix of Evaluation of Internal Factors) was applied in project to analyze and evaluate the internal factors that affect the academic, personal and professional performance of the students of the Instituto Tecnológico de Villahermosa (ITVH). The application of the MEFI tool was carried out as follows:

1. **Identification of Internal Factors:** First, relevant internal factors that could influence academic performance and dropout were identified. These factors included both strengths and weaknesses within the institution and the students' educational context. The factors selected ranged from the level of academic preparation and educational resources available, to the emotional and financial support students receive.
2. **Weighting Assignment:** Each internal factor identified was weighted on a scale of 1 to 5, where 1 represented minor importance and 5 represented major importance. This weighting reflected the relevance of each factor in relation to its impact on academic performance and dropout.
3. **Evaluation and Rating of Factors:** After assigning the weights, each factor was rated according to its current performance in the institution. Ratings were also given on a scale of 1 to 5, where 1 represented poor performance and 5 represented excellent performance.
4. **Calculation of the Weighted Score:** For each factor, a weighted score was calculated.
5. **by multiplying the weighting assigned by the score obtained.** This weighted score helped to quantify the contribution of each factor to overall performance and to identify areas in need of significant improvement.
6. **Analysis of Results:** The weighted scores were summed to obtain a total score representing the overall position of the institution in terms of its internal factors. This analysis identified strengths that could be leveraged and weaknesses that needed to be addressed to improve academic performance and reduce dropout.
7. **Development of Improvement Strategies:** Based on the results obtained from the MEFI matrix, specific strategies were developed to strengthen positive internal factors and mitigate the effects of weaknesses. This included the implementation of

academic support, cross-cutting and professional skills development initiatives, and improved access to financial and emotional resources for students.

The application of the MEFI tool provided a structured framework to evaluate and improve the internal factors that impact academic success and student retention at the Instituto Tecnológico de Villahermosa.

Interpretation of the table

- **Internal Factors:** This column lists the key factors evaluated in the analysis. The factors represent different aspects of the educational environment that can influence academic performance and student retention.
- **Weighting:** This column shows the relative importance of each factor on a scale of 0 to 1. The sum of all weights must equal 1 (100%).
- **Rating:** This column reflects the performance evaluation of each factor on a scale of 1 to 5, where 1 is poor and 5 is excellent.

Weighted Score: This is the result of multiplying the weighting by the rating for each factor. The weighted scores are added together to obtain a total score that indicates the overall effectiveness of the internal factors in the institution.

Table 1. Internal Factors Evaluation Matrix.

Internal Factors	Weighting	Rating	Weighted Score
Quality of teaching staff	0.15	4	0.60
Educational resources (library, laboratories, etc.)	0.10	3	0.30
Level of academic preparation of the students	0.20	3	0.60
Emotional support and psychological counseling to students	0.10	2	0.20
Scholarship programs y financial support	0.15	1	0.15
Strategies for student retention	0.10	2	0.20

Development of transversal skills (communication, etc.)	0.10	3	0.30
Infrastructure and environment learning	0.10	4	0.40

MEFI Total Results

The total score of 2.75, obtained in the analysis of the internal factors of the Instituto Tecnológico de Villahermosa (ITVH), reflects an evaluation that, in general terms, is above average. However, this score also points to critical areas that require urgent attention and improvement. Specifically, the evaluation reveals important deficiencies in the scholarship and financial aid programs, which are fundamental to guarantee the accessibility and permanence of students in the institution.

The need to optimize these programs is evident, given that insufficient financial support can become a considerable barrier for many students, affecting their ability to complete their studies.

In addition, the score highlights the importance of more effectively addressing the emotional and psychological support provided to students. The presence of unaddressed psychological and emotional problems can negatively influence students' academic performance and overall satisfaction. Therefore, it is imperative to implement strategies that strengthen students' emotional well-being, ensuring that they have the necessary support to face academic and personal challenges.

DISCUSSION AND ANALYSIS OF RESULTS

This section analyzes and discusses the results obtained through the application of the Internal Factors Evaluation Matrix (MEFI) at the Instituto Tecnológico de Villahermosa (ITVH). The purpose is to interpret the weighted scores of the internal factors in order to identify the strengths and weaknesses that influence the academic, personal and professional performance of students, as well as retention and dropout.

Strengths Analysis

According to the MEFI results, one of the main strengths of the ITVH is the quality of the teaching staff, which obtained a high score of 4 and a significant weighting of 0.15, resulting in a weighted score of 0.60. This indicates that the teaching staff is well qualified and prepared, which contributes positively to students' academic performance. Likewise, the infrastructure and learning environment: also stood out with a weighted score of 0.40, suggesting that the facilities and educational environment are adequate to facilitate the learning.

Another factor with a positive performance is the students' level of academic preparation, with a weighted score of 0.60. This reflects that, in general, students possess a solid academic foundation that allows them to face educational challenges effectively.

Analysis of Weaknesses

On the other hand, the discussion and analysis of results reveals several critical weaknesses that require immediate attention. One of the most problematic areas is that of scholarship and financial support programs, which received the lowest rating of 1 and a weighting of 0.15, resulting in a weighted score of 0.15. This result indicates that there is a significant deficiency in the financial resources available to students, which could be contributing to dropout due to lack of financial support.

In addition, emotional and psychological support for **students** was also identified as a weakness with a weighted score of 0.20. The lack of adequate services in this area suggests that students may not be receiving the necessary support to manage academic and personal stress, which could negatively impact their performance and well-being.

Student retention strategies were also identified as an area in need of improvement, with a weighted score of 0.20. This indicates that the current strategies implemented by ITVH are not effective enough to keep students enrolled, which could be contributing to the dropout problem.

Recommendations and Improvement Strategies

Based on the **analysis of the MEFI results**, several strategies are proposed to improve the weaknesses identified:

1. **Strengthen scholarship and financial aid programs:** Increasing the resources allocated to scholarships and financial aid could significantly reduce school dropout rates by alleviating the financial burden on students.
2. **Improve emotional and psychological support:** Establishing counseling and psychological support programs to help students manage stress and other emotional challenges can help improve their academic performance and retention.
3. **Review and optimize retention strategies:** Evaluate and adjust current strategies for retaining students, possibly through a more personalized approach that considers individual student needs.

[14] Given this situation, universities need to transform the way they teach, operate and connect with society. It is essential that they adopt educational approaches, methods and strategies that ensure meaningful learning and the formation of specialized professionals that today's society demands.

The research conducted at the Instituto Tecnológico de Villahermosa allows a comprehensive approach to academic performance and the causes of school dropout in this institution of higher education. The results obtained, when compared with previous research in the same field, provide a broader view of the factors that affect the permanence and success of students.

Following are three discussions and analyses with relevant studies that enrich the understanding the findings.

[15] In the study by Fariás Moreira and Angulo Caicedo, the researchers applied interviews and surveys to a sample of 450 students from a higher education institution who were at high risk of dropping out. The data obtained revealed that 65% of the students who dropped out mentioned lack of academic motivation as one of the main factors. In addition, 58% of the respondents indicated that their financial difficulties significantly influenced their decision to drop out of college.

In this study, lack of academic motivation and insufficient financial support were identified as two of the main reasons for dropping out of school. These findings are consistent with the results of the present research, where lack of financial resources and poor motivation are positioned as determining factors in school dropout. At the Instituto Tecnológico de Villahermosa, the data show that a high percentage of students face financial difficulties that affect their academic performance and permanence, highlighting the need for scholarship and financial aid programs as a preventive measure against dropout. This analysis is reinforced by the results of Fariás Moreira and Angulo Caicedo, who conclude that the implementation of comprehensive support systems, including academic counseling and financial support, student retention and reduces school dropout.

[16] The model of academic and social integration proposed by Tinto (1975) states that students involvement in university life, at the academic and social levels, is fundamental for their permanence. Tinto identified that students who feel they are an active part of their university community and who receive institutional support are more likely to continue and

to complete their studies. In the research conducted at the Instituto Tecnológico de Villahermosa, it was found that the lack of integration activities and limited communication between students and teachers retention. Comparing these results confirms that the creation of an environment of integration and constant support is crucial to reduce dropout rates. Thus, promoting extracurricular activities, tutoring and dialogue spaces can be an effective strategy to improve the sense of belonging and, thus, student retention.

[17] In a literature review on dropout in higher education, he highlights how socioeconomic and psychological factors influence continuation of studies. His analysis showed that students with economic constraints and without access to adequate emotional support are more likely to drop out of school. These findings are consistent with results at the Instituto Tecnológico de Villahermosa, where the study revealed that lack of psychological support services and poor academic guidance are factors that contribute to dropping out. Terraza-Beleño concludes that institutions should implement programs that include both financial aid and emotional support services. This approach is also supported in the present research, which highlights the need to strengthen emotional and psychological support to reduce dropout rates.

CONCLUSION

The detailed analysis of student performance indicators at the Instituto Tecnológico de Villahermosa (ITVH) and the evaluation of the effectiveness of the academic programs have made it possible to satisfactorily meet the objectives of the research.

Through the implementation of analytical methods and the application of specific indicators, we have been able to identify critical areas that affect both academic performance and student dropout rates.

The main conclusions, the indicators used and recommendations for future research are presented below.

Responses to Objectives

1. Objective 1: Identify key indicators affecting student academic performance at ITVH.

Key indicators identified include course pass rate, student retention rate, and level of participation in academic and extracurricular activities. Analysis of these indicators revealed that the quality of academic programs, the availability of educational resources, and academic support

have a significant influence on student achievement. In particular, students who actively participate in extracurricular activities and who receive additional academic support tend to perform better academically.

2. Objective 2: Evaluate the effectiveness of academic programs in relation to performance indicators.

Research has shown that current ITVH academic programs are largely effective in improving student achievement, but there are areas that require adjustment. Tutoring and study skills development programs have been shown to be especially beneficial. However, the effectiveness of some early intervention programs could be improved through greater personalization and ongoing follow-up. Data suggest that greater integration of educational technologies and innovative teaching methods could also contribute to improved academic outcomes.

3. Objective 3: Propose recommendations for improving academic programs based on performance indicators.

Based on the findings, the following recommendations are suggested:

- **Reinforcement of Tutoring Programs:** Expand and strengthen tutoring and academic support programs to offer more personalized assistance to students with difficulties.
- **Integration of Educational Technologies:** Incorporate advanced educational technologies into academic programs to enhance the learning experience and facilitate more adaptive teaching.
- **Evaluation and Continuous Improvement:** Establish a system of continuous evaluation of academic programs to ensure that they adjust to the changing needs of students and continuously improve based on the results obtained.

Data for Future Research

To deepen the understanding of the factors affecting student achievement and the effectiveness of academic programs, it is recommended that additional research be conducted in the following areas:

- **Impact of Educational Technologies:** To further evaluate how the integration of educational technologies into the

different educational technologies affects students' performance and motivation.

- **Personalization of Support Programs:** To investigate the effectiveness of personalized academic support programs in improving performance and reducing attrition.
- **Analysis of Extracurricular Participation:** To examine how participation in extracurricular activities influences academic performance and overall student satisfaction.

The study has provided detailed insight into student performance indicators at ITVH and the effectiveness of its academic programs. The findings highlight the need to strengthen and adapt existing programs to maximize their positive impact on student academic achievement. By addressing these recommendations and conducting additional research based on current data, ITVH will be able to optimize its educational strategies and continue to promote a high quality and effective academic environment.

This project has allowed us to comprehensively address academic performance and school dropout at the Instituto Tecnológico de Villahermosa, highlighting the importance of having specific indicators that measure not only academic performance, but also the personal and professional development of students. Through the research conducted, it has become evident that dropping out of school is a multifaceted phenomenon, influenced by various factors ranging from economic and personal problems to lack of motivation and institutional support.

The implementation of clear and measurable indicators has proven to be a valuable tool for evaluating student progress and identifying areas for improvement. These indicators not only allow for monitoring academic performance in terms of grades and achievement, but also facilitate the assessment of cross-cutting skills that are essential for success in the professional arena. By providing specific and timely feedback, students are empowered to recognize their achievements and focus their efforts on areas that require attention.

[18] The integration of specific and transversal competencies is fundamental in any educational project. Historically, specific competencies have had a greater presence in . However, , the focus has shifted to transversal competencies. The new educational trends recognize that the development of specific competencies depends on the inclusion of transversal competencies in the graduate's profile.

In addition, this project has highlighted the need to create an educational environment that fosters student retention and integral development. The strategies proposed to improve educational quality and reduce school dropout are fundamental to ensure that each student has the opportunity to complete his or her education and reach his or her full potential.

In conclusion, the research conducted not only contributes to the understanding of the challenges faced by the Instituto Tecnológico de Villahermosa, but also offers a path towards continuous improvement. By adopting a proactive and student-centered approach, the educational experience can be transformed, thus strengthening the formation of competent professionals committed to their environment. This project represents a significant step towards creating a more promising future for students and for the institution as a whole.

ACKNOWLEDGMENTS

I would like to thank the Instituto Tecnológico de Villahermosa for the support and collaboration provided during the development of this project. Their commitment to education and dedication to the academic development of their students have been essential to carry out this study. To all the academic and administrative staff of the Institute for providing access to the necessary resources and for offering guidance during each stage of the project. Their willingness to provide information and support has been fundamental to the success of this work. The atmosphere of professionalism and constant support from the Instituto Tecnológico de Villahermosa has been invaluable. Thank you for fostering such an enriching academic environment and for allowing students to explore and develop projects that positively impact the educational community.

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