NIRF Ranking Analysis and Strategic Insights for Birla Institute of Technology

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Internship Period
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Acknowledgement

First and foremost, I thank the Almighty God for His grace, wisdom, and strength that enabled me to successfully complete this report on the analysis of NIRF Engineering Rankings (2016–2024).

I express my heartfelt gratitude to **Mrs. Navya K Das**, my mentor at **IPSR Solutions Limited**, for her invaluable guidance, encouragement, and support throughout the course of this project. Her insights and feedback were instrumental in shaping the direction and depth of the analysis.

I also acknowledge the **Ministry of Education, Government of India**, for providing open access to the NIRF data, which formed the foundation of this study.

Finally, I would like to thank my family, friends, and well-wishers for their constant support and motivation during this work.

Executive Summary

Project objective

1. Diagnose Ranking Decline & Stagnation
2. Benchmark Against Peers
3. Analyze Core NIRF Parameters
4. Evaluate 2024 Performance Shift
5. Recommend Strategic Interventions

Key findings

- Research and Professional Practice (RP) is BIT's weakest area, scoring less than half of the IITs' RP scores — this majorly impacts its overall ranking.
- Perception (PR) is extremely low for BIT, indicating a lack of brand value, visibility, or industry/academic recognition.
- While Teaching, Learning & Resources (TLR) and Graduation Outcomes (GO) are also lower for BIT, the gap is less severe than RP or PR.
- Outreach and Inclusivity (OI) is closer to the top performers, showing relative strength in this area.

Recommended actions

1. Strengthen Research Output
2. Boost Perception (PR)
3. Improve Graduation Outcomes (GO)
4. Enhance TLR through Infrastructure
5. Leverage Strength in OI

Tools used

1. Excel
2. Power Bi

Introduction

Purpose of the internship

This project was undertaken as part of my role as a NIRF consultant engaged by an engineering institute seeking to understand and improve its standing in the National Institutional Ranking Framework (NIRF). The primary objective of this analysis is to diagnose the reasons behind the institute's declining or stagnant NIRF rank over the years. To achieve this, I conducted a detailed benchmarking exercise against both top-performing institutions (to identify best practices and success factors) and low-performing institutions (to highlight common pitfalls and areas of concern). Based on this comparative analysis, the report offers data-driven, strategic recommendations aimed at helping the institute enhance its NIRF performance and strengthen its position in future rankings.

What is NIRF and why it matters

The National Institutional Ranking Framework (NIRF) is an initiative by the Ministry of Education, Government of India, launched on 29th September 2015. It provides a methodology to rank higher education institutions across India. The framework evaluates institutions based on several parameters, offering a comprehensive assessment of their performance. The rankings are published annually and serve as a benchmark for quality in higher education.

The Five Core Parameters of NIRF

NIRF assesses institutions based on five key parameters:

1.Teaching, Learning & Resources (TLR)

This parameter evaluates the quality of teaching, learning, and the availability of resources. It includes:

- **Student Strength (SS):** Total number of students enrolled, including doctoral students.
- **Faculty-Student Ratio (FSR):** Emphasis on maintaining an optimal ratio with a focus on permanent faculty.

• **Faculty Qualifications and Experience (FQE):** Assessment of faculty with Ph.D. degrees and their teaching/research experience.
• **Financial Resources and Utilization (FRU):** Evaluation of the institution's financial resources and their effective utilization.
• **Online Education (OE):** Incorporation of online learning platforms and digital resources.
• Multiple Entry/Exit, Indian Knowledge System, and Regional Languages (MIR): Integration of flexible academic pathways and promotion of regional languages.
This parameter holds a weightage of 30% in the overall ranking.

2. **Research and Professional Practice (RPP)**

This parameter assesses the research output and professional practices of institutions.
It encompasses:
• Publications (PU): Quantity and quality of research publications.
• Quality of Publications (QP): Impact of research through citations and journal quality.
• Intellectual Property Rights (IPR): Number of patents published and granted.
• Footprint of Projects and Professional Practice (FPPP): Research projects and professional engagements.
• Publications & Citations in Sustainable Development Goals (PSDGs): Research contributions aligned with SDGs.
RP also carries a weightage of 30% in the ranking framework.

3. **Graduation Outcomes (GO)**

GO measures the success of students in terms of graduation and further studies.
It includes:
• ***University Examinations (GUE):*** Performance in final year examinations.
• ***Number of Ph.D. Students Graduated (GPHD):*** Quantity of doctoral degrees awarded.
This parameter has a weightage of 20% in the overall ranking.

4. **Outreach and Inclusivity (OI)**

OI evaluates the inclusiveness and outreach efforts of institutions.
It considers:
• ***Region Diversity (RD):*** Percentage of students from other states or countries.
• ***Women Diversity (WD):*** Representation of female students and faculty.
• ***Economically and Socially Challenged Students (ESCS):*** Support for underprivileged students.
• ***Facilities for Physically Challenged Stu***
dents (PCS): Infrastructure and support for differently-abled individuals.

• ***Perception (PR) Ranking:*** Stakeholder perception of the institution.
OI contributes 10% to the overall score.

5. **Perception (PR)**

This parameter captures the perception of the institution among peers, employers, and the public. It includes:
• ***Academic Peers and Employers (PR):*** Reputation among academic institutions and employers.
Perception holds a weightage of 10% in the NIRF ranking.

why it matters

• **National Visibility**: A good NIRF rank enhances the institute's reputation and credibility at a national level.
• **Student Choice**: Many students and parents rely on NIRF rankings while selecting colleges.
• **Funding & Accreditation**: Strong rankings can influence government grants, accreditations, and collaborations.
• **Benchmarking**: Helps institutions identify strengths, weaknesses, and opportunities for improvement.
• **Accountability**: Encourages data transparency and continuous performance tracking.

In summary, NIRF plays a crucial role in promoting **competitive quality improvement** among Indian educational institutions and serves as a valuable tool for **strategic planning and policy-making**.

Objectives of the analysis

1. **Year-wise Ranking Trends**
To analyze the annual NIRF scores and ranks of Birla Institute of Technology (BIT) from 2016 to 2024 to identify:

- Patterns of rise or decline in performance
- Key inflection points (e.g., the sharp drop in 2017)
- Periods of stagnation or recovery
- This objective helps assess the institute's overall trajectory and identify years that require deeper analysis or corrective focus.

2. **Parameter-wise Performance**
To evaluate BIT's performance across the five core NIRF parameters:

- Teaching, Learning & Resources (TLR)
- Research and Professional Practice (RP)
- Graduation Outcomes (GO)
- Outreach and Inclusivity (OI)
- Perception (PR)
  The aim is to uncover which parameters have driven score improvements or declines and to prioritize areas needing strategic intervention.

3. **Competitor Benchmarking**
To benchmark BIT's NIRF performance against:

- Top-ranked institutions (e.g., IIT Madras, IIT Delhi, IIT Bombay) — to identify best practices and success drivers
- Lower-ranked institutions — to understand pitfalls BIT should avoid
  This comparison enables actionable insights and strategic goal-setting based on competitive positioning.

Overview of the selected institution and reason for choosing it

Birla Institute of Technology (BIT), established in 1955 in Mesra, Ranchi, is a premier deemed university known for its legacy in engineering and applied sciences education. It has contributed significantly to technical education in India and has a strong alumni base spread across industries and academia globally. BIT offers undergraduate, postgraduate, and doctoral programs in engineering, technology, management, and sciences, with a reputation for academic rigor, research initiatives, and entrepreneurship development.

BIT has consistently featured in the NIRF Engineering rankings since the framework's inception in 2016. However, its ranking trajectory has shown significant fluctuation and a concerning downward trend in recent years.

The selection of Birla Institute of Technology as the focus of this project was driven by the following reasons:

1. **Sharp Rank Drop and Performance Stagnation**
    - BIT dropped from **Rank 17 in 2016** to **Rank 53 in 2022 and 2023**, followed by only a slight improvement in 2024.
    - This dramatic shift makes it an ideal case to study performance volatility in NIRF rankings.
2. **Need for Strategic Diagnostic**
    - The institute appears to be under-leveraging its strong legacy and infrastructure. A detailed NIRF parameter-wise diagnosis can help pinpoint gaps and areas of underperformance.
3. **Opportunity to Recommend High-Impact Improvements**
    - As a mid-tier institute with good foundational strengths, BIT has the potential to improve its ranking significantly through targeted interventions in research, perception, and outcomes.
4. **Client-Based Scenario Simulation**
    - The project simulates a consultancy setting where the analyst acts on behalf of BIT to **benchmark against top performers**, **learn from low-ranked institutions**, and **recommend actionable strategies** for rank improvement.

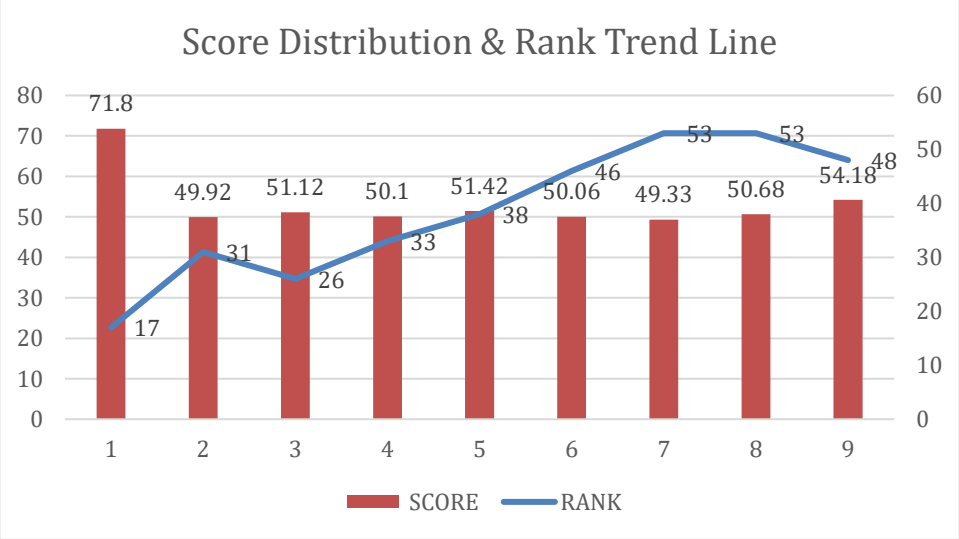
Methodology

- **Data Collection:** Sources like NIRF portal, institute websites, etc.
- **Data Preparation:** Cleaning, formatting, merging datasets
- **Tools & Technologies:** Excel, Python, Power BI
- **Metrics Analyzed:** Teaching & Learning, Research, Graduation Outcomes, etc.

Data Analysis & Findings

1. Year-wise ranking trends

YEAR	RANK	SCORE
2016	17	71.8
2017	31	49.92
2018	26	51.12
2019	33	50.1
2020	38	51.42
2021	46	50.06
2022	53	49.33
2023	53	50.68
2024	48	54.18



Interpretation

1. Sharp Decline After 2016

- In 2016, BIT ranked 17th with a score of 71.8.
- In 2017, the score plummeted to 49.92 (↓21.88 points), and the rank dropped by 14 positions to 31.

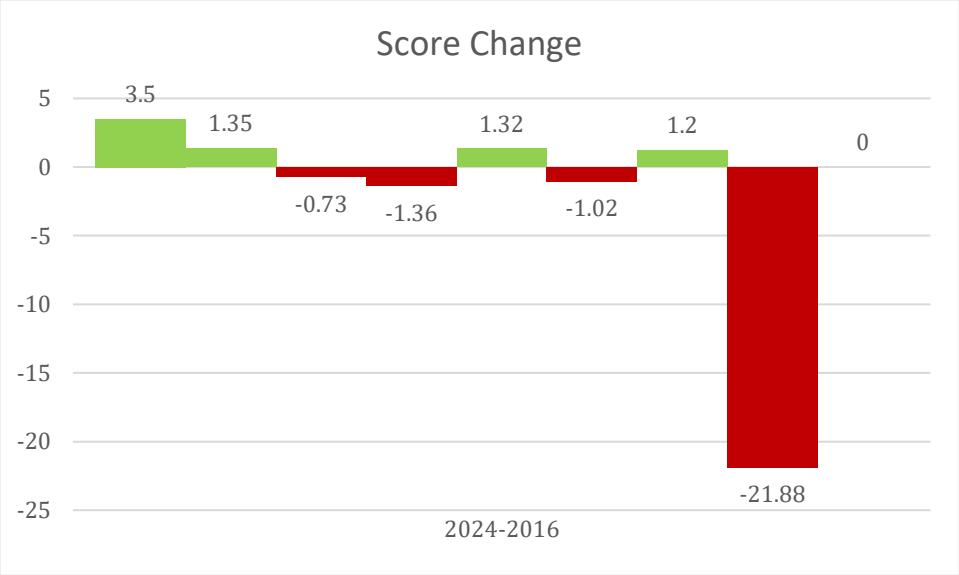
This suggests a major structural or reporting issue occurred between these two years — possibly due to changes in NIRF methodology, data reporting inconsistencies, or actual declines in research/perception.

2. Stagnation Period (2017–2023)
For 7 consecutive years, BIT's score remained around 49–51, and rank deteriorated steadily from 31 (2017) to 53 (2022 & 2023).
Indicates minimal progress or improvement in core ranking parameters during this time.

3. Positive Movement in 2024
In 2024, score improved to 54.18 — the highest since 2016.
Corresponding rank improved by 5 places (from 53 to 48).
Suggests recent initiatives may be paying off, especially in TLR and GO (as seen in the previous dataset).

BIT Score Change

YEAR	SCORE	SCORE CHANGE
2024	54.18	3.5
2023	50.68	1.35
2022	49.33	-0.73
2021	50.06	-1.36
2020	51.42	1.32
2019	50.1	-1.02
2018	51.12	1.2
2017	49.92	-21.88
2016	71.8	0



Interpretation

1. Major Score Crash in 2017
In 2017, BIT's score plummeted by 21.88 points (from 71.8 to 49.92).

This sharp decline likely reflects:

- A significant drop in performance across critical NIRF parameters (especially Research and Perception, as seen earlier).
- Possible methodological changes in NIRF scoring or incomplete/inaccurate data submission.

2. Long Phase of Score Stagnation (2017–2023)
From 2017 to 2023, the score hovered between ~49 and 51, with very minimal annual changes.

Indicates:

- Structural issues were not addressed deeply.
- Performance may have plateaued due to limited research activity, perception, or student outcome improvements.

The institution neither significantly deteriorated nor improved — indicating complacency or lack of strategic focus.

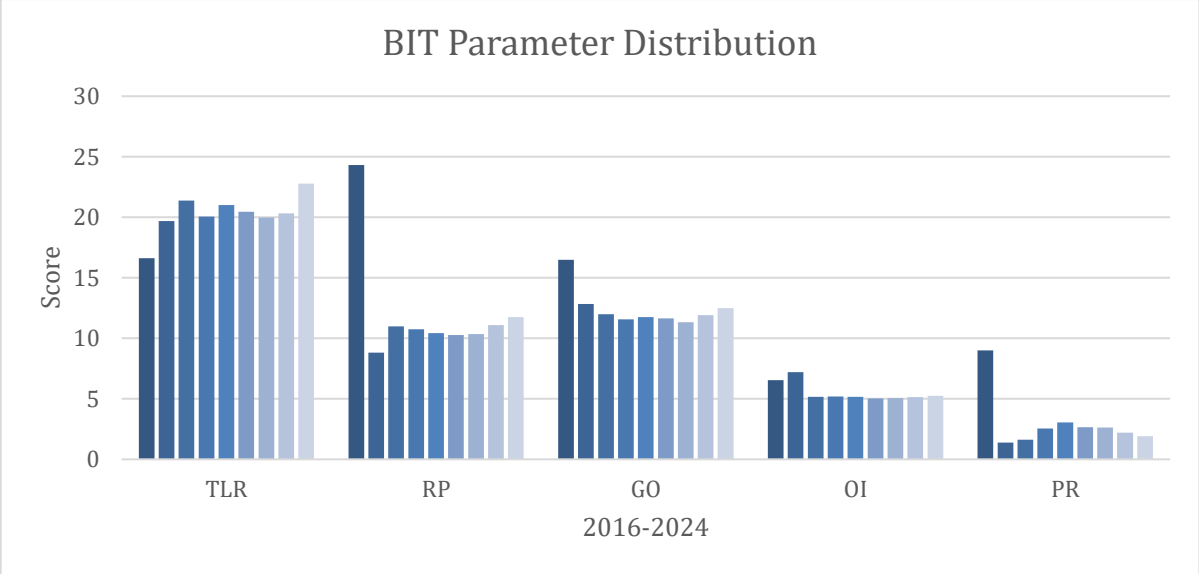
3. Significant Improvement in 2024
In 2024, BIT's score jumped by +3.5, the highest positive change since 2017.

Reflects:

- Potential positive impact of recent initiatives (e.g., faculty hiring, infrastructure upgrades, research efforts).
- Momentum toward recovery after years of stagnation.

2. Parameter-wise performance

YEAR	TLR	RP	GO	OI	PR	Overall Score
2016	16.62	24.32	16.49	6.55	9	72.98
2017	19.68	8.81	12.84	7.21	1.38	49.92
2018	21.37	10.98	11.98	5.17	1.62	51.12
2019	20.05	10.74	11.56	5.2	2.55	50.1
2020	21.02	10.44	11.75	5.16	3.05	51.42
2021	20.46	10.26	11.65	5.04	2.65	50.06
2022	19.97	10.36	11.32	5.06	2.62	49.33
2023	20.33	11.1	11.91	5.14	2.2	50.68
2024	22.78	11.76	12.5	5.24	1.9	54.18



Interpretation

1. Sharp Drop After 2016

- In 2016, BIT had an impressive overall score of 72.98, mainly due to a very high RP (24.32) and PR (9.0).
- A sudden drop in RP (to 8.81) and PR (to 1.38) in 2017 led to a huge decline in score (49.92).

2. Stagnant Performance (2017–2023)

For nearly 7 years, BIT's overall score hovered around 49–51.

Key metrics like GO, RP, and OI remained mostly flat, suggesting limited structural improvement.

3. Gradual Recovery in 2024

- In 2024, BIT achieved its highest TLR score (22.78), showing improved faculty/infrastructure quality.
- RP and GO also improved slightly, indicating some revival in research and student outcomes.
- However, Perception (PR) remains very low (1.9) compared to its 2016 peak, dragging down the total score.

3. Competitor benchmarking

Benchmarking with top ranked institutions

INSTITUTE NAME	TLR	RP	GO	OI	PR	SCORE	YEAR
IIT MADRAS	28.737	27.93	16.214	6.585	10	89.46	2024
IIT DELHI	25.713	27.66	16.904	6.539	9.853	86.66	2024
IIT BOMBAY	25.902	25.254	16.956	5.867	9.113	83.09	2024
BIT	22.776	11.76	12.5	5.244	1.904	54.18	2024

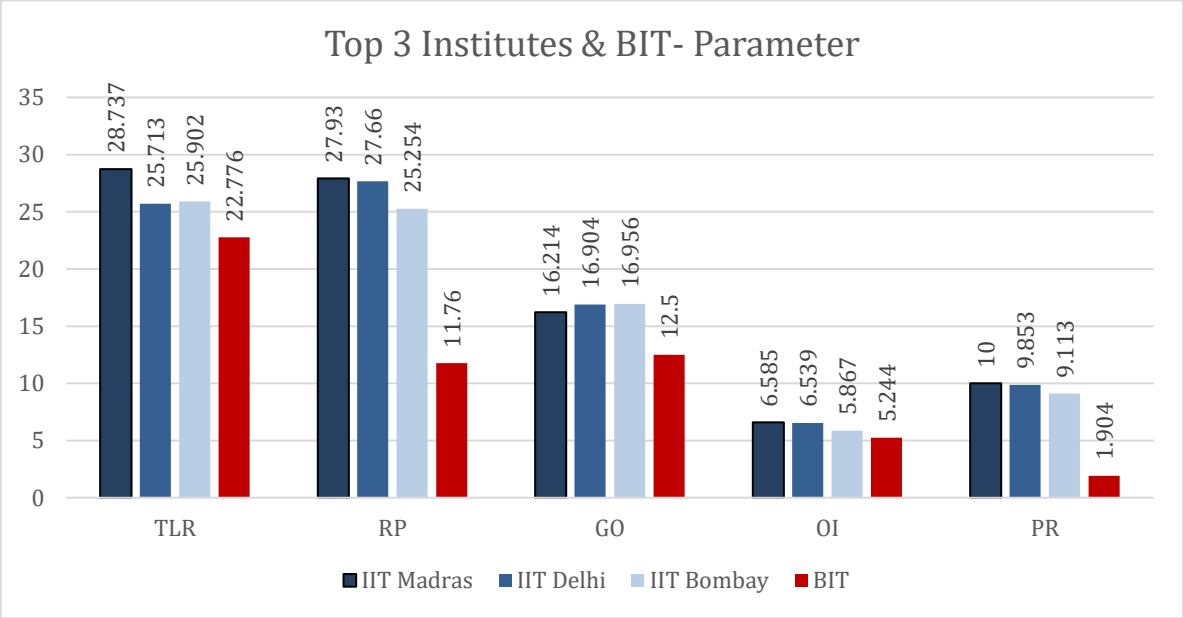


Fig .

Research and Professional Practice (RP) is BIT's weakest area, scoring less than half of the IITs' RP scores — this majorly impacts its overall ranking.

Perception (PR) is extremely low for BIT, indicating a lack of brand value, visibility, or industry/academic recognition.

While Teaching, Learning & Resources (TLR) and Graduation Outcomes (GO) are also lower for BIT, the gap is less severe than RP or PR.

Outreach and Inclusivity (OI) is closer to the top performers, showing relative strength in this area.

Interpretation

1. Research and Professional Practice (RP) is the most critical gap
   - BIT's RP score (11.76) is less than half that of the top IITs (avg ~27.6).
   - This 15–16 point gap in RP alone explains a major portion of the 30+ point overall score difference.
   - Indicates low publication volume, quality, or research funding.

2. Perception (PR) is critically low
   - BIT scored 1.904, compared to an average PR of 9.655 among top 3 IITs.
   - That's a drop of ~80%, which drastically affects the final score
   - Suggests low industry/academic reputation, or lack of visibility in NIRF perception surveys.

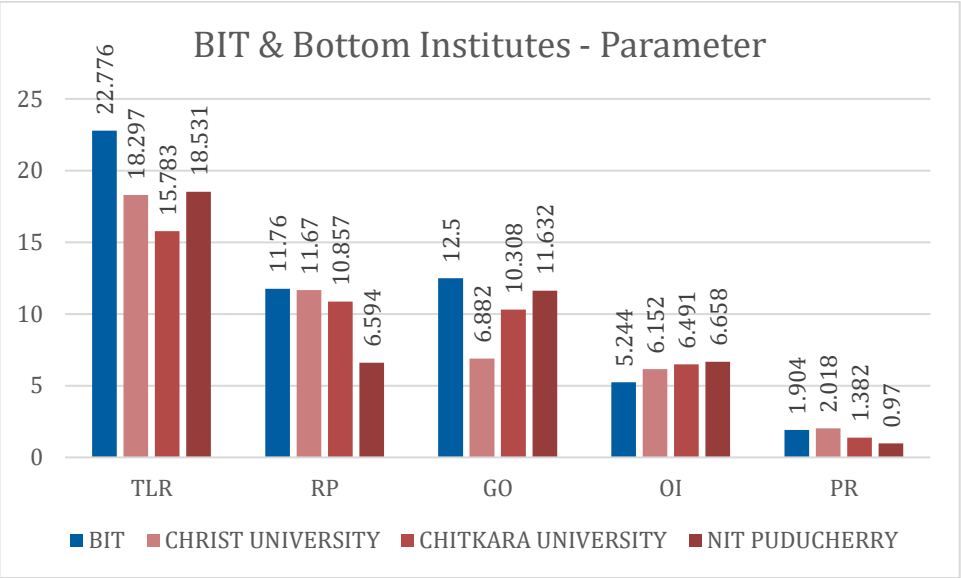
3. Graduation Outcomes (GO) show a meaningful difference
   - BIT: 12.5, vs IIT avg: 16.691 → about 25% lower.
   - Indicates relatively weaker placements, graduate quality, or higher education continuation rates.

4. Teaching, Learning & Resources (TLR) is relatively closer
   - BIT: 22.776, vs IIT avg: 26.784 → ~15% behind.
   - This is BIT's strongest relative metric, suggesting fair faculty strength/infrastructure.

5. Outreach & Inclusivity (OI) is fairly close to the top
   - BIT: 5.244, vs IIT avg: 6.33 → ~17% behind.
   - Shows moderate performance in diversity, regional representation, and social equity.

Benchmarking with bottom ranked institutions

INSTITUTE NAME	TLR	RP	GO	OI	PR	SCORE	YEAR
BIT	22.776	11.76	12.5	5.244	1.904	54.18	2024
CHRIST UNIVERSITY	18.297	11.67	6.882	6.152	2.018	45.02	2024
CHITKARA UNIVERSITY	15.783	10.857	10.308	6.491	1.382	44.82	2024
NIT PUDUCHERRY	18.531	6.594	11.632	6.658	0.97	44.38	2024



1. **Overall Standing:**
   - **BIT** leads significantly with an overall **score of 54.18**, whereas the others range between **44.38 and 45.02**.
   - This suggests BIT is performing better in several areas but still far from the top-ranked institutions (e.g., IITs scoring 80+).

2. **Teaching, Learning & Resources (TLR):**
   - BIT's **TLR score (22.78)** is higher than all three bottom-ranked institutions, indicating stronger faculty resources, infrastructure, or student-teacher ratios.
   - **Chitkara University**, in contrast, has the weakest TLR at **15.78**.

3. **Research & Professional Practice (RP):**
   - BIT leads slightly (**11.76**) over Christ (**11.67**) and Chitkara (**10.86**), but outperforms **NIT Puducherry (6.59)** considerably.
   - However, the differences between BIT and Christ/Chitkara suggest **BIT is not far ahead** in research, indicating room for growth.

4. **Graduation Outcomes (GO):**
   - BIT excels here with the **highest GO (12.5)** among all four institutions, showing strong placement records or higher studies metrics.
   - **Christ University** performs poorly here (**6.88**), highlighting a key strength for BIT.

5. **Outreach & Inclusivity (OI):**
   - BIT lags in OI with a score of **5.24**, while all three bottom-ranked institutions score above **6.15**, with **NIT Puducherry at 6.65**.
   - This indicates BIT has **limited regional diversity, gender inclusion**, or representation of disadvantaged groups.

6. **Perception (PR):**
   - BIT's perception score (**1.90**) is **below Christ University (2.02)** and only slightly above Chitkara (**1.38**) and NIT Puducherry (**0.97**).
   - This suggests **BIT's brand visibility and national reputation need strengthening**.

Recommendations (Actionable Insights)

Strategies based on NIRF parameters

1. Strengthen Research Output (RP)

Research and Professional Practice (RP) has seen significant decline since 2016 and remains a critical area for recovery and growth. Compared to lower-ranked institutions, BIT has a modest edge, but not enough to drive major rank improvements.

Actions:

- Invest in faculty development programs, Ph.D. enrolments, and research infrastructure.
- Create research clusters, offer internal seed funding, and set department-level research targets.
- Encourage publications in indexed journals, patents, conference papers, and participation in government-funded research projects (DST, AICTE, DRDO).
- Make research output visible through platforms like Scopus, Web of Science, and institutional repositories.

2. Rebuild Institutional Perception (PR)

Perception has shown the steepest decline—from 9 in 2016 to 1.9 in 2024—despite other improvements. BIT currently ranks below Christ University in this parameter, indicating a gap in institutional visibility and reputation.

Actions:

- Develop strategic branding through alumni engagement, media coverage, and academic-industry partnerships.
- Host conferences, technical festivals, and national-level summits to increase presence in academic and professional circles.
- Promote alumni success stories and institutional achievements through digital platforms.
- Apply for international rankings and participate in academic conclaves to expand visibility.

3. Improve Graduation Outcomes (GO)

Although BIT still leads in GO when compared to the bottom three institutions, its score has declined from 16.49 in 2016 to 12.5 in 2024. This needs to be addressed to maintain competitive advantage.

Actions:

- Enhance placement training, soft-skills development, and internship pipelines.

- Strengthen industry collaboration for higher-quality employment opportunities.
- Provide mentorship and support for students pursuing higher education or entrepreneurship.
- Track placement and progression metrics rigorously and improve reporting accuracy.

4. Enhance Teaching, Learning & Resources (TLR)

BIT has made consistent gains in TLR, outperforming peer institutions like Chitkara and Christ University. Sustaining this improvement is essential for long-term academic quality.

Actions:

- Continue investments in modern laboratories, digital learning tools, and upgraded libraries.
- Recruit more qualified faculty to improve student-teacher ratio and academic outcomes.
- Support continuous professional development and certifications for teaching staff.

5. Leverage and Expand Outreach & Inclusivity (OI)

BIT's OI score is lower than Christ, Chitkara, and NIT Puducherry, suggesting it has room to improve diversity and access.

Actions:

- Increase student intake from underrepresented regions, communities, and genders.
- Offer more scholarships, bridge programs, and special entry schemes.
- Publicize inclusivity initiatives to enhance public perception and institutional image.

Short-term and long-term action items

Short-Term Action Items (0–1 year)

1. Strengthen NIRF Data Reporting
    - Ensure accurate, complete, and timely submission of NIRF data.
    - Conduct annual internal audits of metrics and data sources.
2. Boost Graduation Outcomes
    - Improve placement assistance and alumni mentoring for higher education.
    - Refine data collection and analysis around student progression.
3. Improve Faculty-Student Ratio
    - Recruit new faculty and optimize teaching assignments.
    - Strengthen mentoring systems for student academic support.

4. Increase Local Visibility
    - Host regional seminars, hackathons, and industrial visits.
    - Promote achievements through local media, websites, and academic platforms.
5. Enhance Immediate Research Visibility
    - Encourage faculty to publish in reputed journals.
    - Actively maintain research profiles on public databases and institutional portals.

Long-Term Action Items (1–3 years)

1. **Invest in Research Ecosystem**
    - Establish dedicated research and innovation centers.
    - Facilitate industry-academia collaborations on applied research.
2. **Build National and Global Perception**
    - Launch national-level branding campaigns leveraging alumni and collaborations.
    - Participate actively in global academic networks and rankings.
3. **Strengthen Faculty Credentials**
    - Support PhD completions, international fellowships, and grants acquisition.
    - Incentivize department-wise research targets and knowledge dissemination.
4. **Expand Diversity and Inclusion**
    - Offer targeted scholarships and outreach to remote and underserved communities.
    - Promote BIT as an inclusive, student-centric institution.
5. **Implement Continuous Improvement Strategy**
    - Establish a NIRF Performance Cell with annual target tracking.
    - Monitor performance through internal KPIs aligned with NIRF criteria.

Challenges Faced

- Data availability or quality issues
- Tool or technical limitations
- Analysis complexity

Conclusion

This project offered me a comprehensive understanding of how the National Institutional Ranking Framework (NIRF) functions and why it is a critical benchmarking tool for higher education institutions in India. By analyzing the multi-year performance of Birla Institute of Technology (BIT), I gained insight into how fluctuations in specific parameters—particularly Research and Professional Practice

(RP) and Perception (PR)—can significantly impact overall rankings. The process of working with real institutional data enhanced my technical skills in data cleaning, transformation, and visualization using Power BI. I also developed the ability to interpret trends, benchmark performance against peer institutions, and translate those insights into practical, strategic recommendations.

Beyond technical proficiency, this analysis sharpened my ability to think critically and communicate findings in a manner relevant to institutional decision-makers. The value of this analysis lies in its ability to help BIT identify the exact areas that need attention, such as improving research output, faculty strength, and institutional branding. By highlighting both short-term fixes and long-term strategic actions, the report serves as a guiding framework for BIT to regain its competitive edge and move upward in future NIRF rankings.

References

- NIRF official website

Research papers:

- A Comprehensive Analysis on Effectiveness of Parameters in NIRF India Rankings 2023 for Top 100 Engineering Institutes