

## 5.1 Compliance Scoring Framework for Telecom Service Providers in India

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### Abstract

The telecom ecosystem in India presents a vibrant landscape with over 3,500 operators providing a wide range of telecom services. These operators, predominantly small to medium enterprises, are essential for last-mile connectivity. However, during recent Telecom Outreach Programs (TOP) conducted by field units of the Department of Telecommunications (DoT), several service providers voiced concerns over their limited access to finance. A significant factor attributed to this challenge is the absence of a standardized and credible telecom compliance index to demonstrate their regulatory reliability, which unfairly influence financial decisions across the sector.

Regulatory compliance is critical to ensuring integrity, sustainability, and equitable growth in the telecom sector. This paper introduces a novel, multidimensional Compliance Scoring Framework for Telecom Service Providers (TSPs) in India. The framework consolidates key regulatory performance indicators—including timeliness of license fee payments, proportion and recurrence of financial defaults, document submission behavior, and health of financial and performance bank guarantees—into a comprehensive 0–100 score. The score includes innovative elements such as decay weighting for older defaults, to ensure the impact of non-compliance fades with time and override provisions for severe infractions (e.g., PBG encashment or termination proceedings).

This scoring tool addresses regulatory, institutional, and financial challenges identified by TRAI, ITU, RBI and feedback received during DoT's stakeholder consultations (Press Information Bureau [PIB], 2023). It provides a credible, regulator-driven benchmark that enhances financial accessibility, allows risk-based supervision, and bridges information asymmetry for lenders and investors. Designed to be scalable and replicable across sectors, this scoring framework offers a timely and efficient solution for comprehensive compliance monitoring.



## Keywords

Telecom Compliance, Risk Scoring, Bank Guarantee, Regulatory Monitoring, Financial Accessibility.

## Introduction

Effective regulatory compliance is the cornerstone of competitive, reliable, and consumer-centric telecommunications markets. In India, the Department of Telecommunications (DoT) under the Ministry of Communications oversees licensing, fee collection, and enforcement of performance guarantees, ensuring that service providers adhere to prescribed norms (DoT, 2023). Despite extensive regulations, current supervisory practices lack a standardized way to measure compliance performance and differentiate high- from low-risk licensees. This gap complicates both regulatory prioritization and financial decision-making by banks and investors.

Recent insights from outreach programs by DoT as published in the Press Information Bureau (PIB, 2023) reveal that many TSPs struggle to secure financing due to the absence of credible, standardized compliance ratings. National and International bodies such as the Telecom Regulatory Authority of India (TRAI) and the International Telecommunication Union (ITU) have advocated for risk-based, data-driven monitoring frameworks to modernize telecom regulation (TRAI, ITU). Likewise, the Reserve Bank of India (RBI) underscores the importance of structured compliance data in informing credit risk assessments (RBI) while the World Bank highlights the role of transparent metrics in promoting financial inclusion in capital- intensive sectors (World Bank, 2023).

In response, this paper proposes a Compliance Scoring Framework that synthesizes multiple compliance dimensions into a single quantitative score. The framework's objectives are to:

1. Standardize compliance evaluation across all telecom circles in India.
2. Enable DoT to adopt risk-based supervision, earmarking resource allocation for high-risk entities.
3. Facilitate financial institutions in distinguishing creditworthy operators from those requiring remediation.

By enabling practical, scalable, and cost-efficient compliance benchmarking, this scoring framework empowers stakeholders—including regulators, investors, and operators—with enhanced decision-making tools grounded in data.

## Literature Review

Composite scoring models are extensively applied across financial services, environmental regulation, and taxation compliance to capture multidimensional behavior through quantifiable indices (Kumar et al; 2020, Kumar & Gupta, 2020). In sectors where regulatory oversight involves continuous data submission and financial discipline—such as banking and insurance—compliance scores help allocate supervisory attention, inform credit ratings, and guide investor decisions. However, the telecom sector, especially in emerging economies like India, has lagged in the development of similarly structured indices.

Nationally, TRAI (TRAI, 2022) and the International Telecommunication Union (ITU) (ITU, 2021) have emphasized the importance of building risk-informed regulatory strategies. They recommend developing frameworks that synthesize both quantitative indicators (e.g., timelines of fee and guarantee submissions) and qualitative red flags (e.g., encashment or termination events). The Reserve Bank of India (RBI, 2022) also recognizes that such indices are instrumental in reducing information asymmetry between creditors and borrowers.

Gupta and Reddy (2020) proposed a basic scoring model for telecom licensees based on frequency of defaults and document compliance, which influenced this framework's parameter selection. Similarly, Kumar and Gupta (2020) advocated for temporal decay weighting, a method wherein the penalty of non-compliance reduces progressively over time—balancing the need for accountability with an incentive to improve behavior. This principle is adopted in our proposed scoring logic.

From an international perspective, regulatory agencies such as the Federal Communications Commission (FCC) in the United States and Ofcom in the United Kingdom have experimented with Supervision systems based on risk levels. For instance, FCC's "High-Cost Program Compliance Measures" assesses Universal Service Fund recipients using financial and reporting compliance data. Ofcom's enforcement prioritization relies on submission punctuality and complaint metrics. However, neither provides a publicly

unified score that can be independently used by financial institutions or cross-referenced for inter-circle performance evaluation.

This paper distinguishes itself by proposing a publicly shareable, standardized compliance score that can serve both regulatory and financial oversight purposes. Unlike opaque audit-based ratings, this model operates on a quantitative, formula-based structure that is adaptable to India's licensing and revenue assessment ecosystem. Its novelty lies in the cross-circle comparability and modular weighting structure—enabling a unified compliance profile for entities operating in multiple jurisdictions.

## Methodology

### Component Selection and Weighting

The Compliance Score aggregates seven regulatory performance components, each weighted to reflect its relative importance based on regulatory risk exposure and supervisory priorities set by the Department of Telecommunications:

Component	Weight (%)
Quarterly License Fee Compliance	30
Financial Bank Guarantee (FBG) Compliance	20
Performance Bank Guarantee (PBG) Compliance	20
Quarterly Document Compliance	15
License Age	10
Multiple Licenses	5
Termination Proceed	-50

### Notes:

- ***Quarterly License Fee Compliance (30%):*** This carries the highest weight as timely revenue remittance is essential for government finances and sectoral stability.
- ***FBG and PBG Compliance (20% each):*** Bank guarantees are risk mitigation tools ensuring financial and performance accountability, hence their high significance.
- ***Document Compliance (15%):*** Ensures transparency and regulatory traceability.

- **License Age (10%):** Older licenses typically reflect operational maturity and stability.
- **Multiple Licenses (5%):** More licenses indicate broader operational presence; scoring is positive, not punitive—1 license scores 0; 2 licenses score 3; 3 or more licenses score 5.
- **Termination Proceed:** A penalty override subtracting 50 points if termination has been initiated, reflecting the most severe non-compliance.

## Scoring Logic

The scoring logic emphasizes the temporal decay of default impact—allowing adverse effects to fade over time when compliance resumes—as well as the proportional severity and recurrence of defaults across quarters. Each component is converted into a sub-score, then weighted and summed to produce the final 0–100 Compliance Score. Details of individual parameters are provided below:

1. Years of spread of impact is taken as 4 years, thus quarterly decay accounts for 6.25% per quarter. This is taken with the consideration that a balance between penalty for a non-compliance and an opportunity to improve score exists.
2. For non-payment of license fee, the maximum tolerance is taken as 4 quarters, which is in line with the financial compliances prescribed under Unified license agreement wherein the final assessments, dues and actions are prescribed on submission of audited annual financial statements i.e., after completion of 4 complete quarters.
3. For proportions defaulted, a table of proportions along with Penal impact in % is considered, wherein impact of 40% or more of total payment due is treated as with 100% of penalty prescribed in the specific index.
4. Licensees which follow all compliances, as time progresses are observed to remain compliant and thus the score considers temporal advantage for the compliance. This is in line with the credit scoring frameworks adopted by credit agencies where a longer credit score is favoured.



## Temporal Decay and Recency Adjustment Temporal Decay and Recency Adjustment

To ensure recent defaults carry greater weight, each defaulted quarter is adjusted by a decay factor over a four-year horizon (16 quarters):

- Decay per Quarter:  $100\% - (n-1) \times 6.25\%$ , for  $n = 1$  to 16.
- Beyond 16 quarters  $\rightarrow 0\%$  impact.

### Example Decay Table

Quarter since Default	Decay Weight (%)
1	100.00
2	93.75
3	87.50
4	81.25
...	...
16	6.25
$\geq 17$	0.00

Default counts used in the Quarterly License Fee and Document compliance sub- scores should be multiplied by the corresponding decay weight before computing the penalty.

## Proportional Default Impact

License Fee defaults also incur a proportional penalty based on the percentage of dues unpaid:

Default % of Fee	Penal Impact %
0–10	25
10–20	50
20–30	75
$\geq 30$	100

Applied as: Sub-score = Weight  $\times$  (1 – Penal Impact%) (e.g., 15% default  $\rightarrow 15 \times (1 - 0.50) = 7.5$ ).

## Final Score Aggregation

The final Compliance Score is the sum of all weighted sub-scores (after decay and proportional adjustments), offset by any termination override. Scores are floored at zero and capped at 100.

## Score Interpretation

To facilitate actionable insights, Compliance Scores are categorized as follows:

Score Range	Rating
90 – 100	Excellent (AA)
80 – 89	Very Good (A)
70 – 79	Good (B)
60 – 69	Moderate (C)
50 – 59	Satisfactory (D)
0 – 49	Poor (E)

## Illustrative Example

The final Compliance Score is the sum of all weighted sub-scores (after decay and proportional adjustments), offset by any termination override. Scores are floored at zero and capped at 100.

A hypothetical telecom operator which has taken license 4 years ago, has multiple licenses of Department of Telecommunications and is not recommended for termination at any stage, is represented below with following particulars:

1. Licensee defaulted 7 quarters ago in license fee submission for 2 consecutive quarters.
2. Licensee also defaulted 7 quarters ago and had not submitted its quarterly documents for 2 consecutive quarters.
3. However, the licensee was compliant with its bank guarantees.

The calculation of compliance score, based on the prescribed framework, is:

Telecom history card	Weightage	Quarter of last default	No. of quarters defaulted	Proportion of default	Age of license (In years)	Multiple license	Termination requested	Score
Quarterly license fee compliance	30%	7	2	20%				25.3
FBG Compliance	20%	0						20
PBG Compliance	20%	0						20
Quarterly document compliance	15%	7	2					10.3
License Age	10%				4			8
Multiple license	5%					yes		5
Termination recommended	-50%						no	0

Telecom Compliance Score **88.63**

Telecom Compliance Score is calculated to be 88.63 i.e. Very Good (A) and thus may be considered with high reliability by the financial institutions and the Department.

## Discussion and Relevance

The proposed Compliance Scoring Framework delivers a robust, transparent, and scalable solution for quantifying regulatory adherence across India's diverse telecom landscape. By consolidating multiple compliance dimensions—timeliness, default severity, bank guarantee enforcement, document submission, license tenure, and multi circle behaviour—into a unified metric, the model enables:

- **Risk Based Supervision:** The Office of the Principal Controller of Communication Accounts (PCCA) in each telecom zone can publish a Comprehensive Quarterly Compliance Score report, facilitating inter regional benchmarking and prioritization of audit resources toward high-risk licensees.
- **Enhanced Financial Accessibility:** Structured compliance scores, endorsed by the DoT, provide credit agencies, lending institutions, and investors with reliable, regulator-validated indicators to reduce information asymmetry and streamline credit appraisal for capital intensive telecom projects.

- **Performance Benchmarking:** Quarterly public disclosure of scores creates a competitive, incentive driven environment in which operators strive to maintain or improve their rating, thereby driving sector wide compliance excellence.
- **Policy and Planning Integration:** Policymakers can leverage aggregate score trends to identify systemic compliance gaps, evaluate the efficacy of regulatory interventions, and calibrate license renewal criteria or incentive schemes tied to compliance performance.
- **Stakeholder Confidence:** Transparent scoring increases trust among consumers, industry partners, and financial markets, reinforcing the credibility of India's telecom regulatory regime.

Furthermore, the framework's temporal decay mechanism ensures that past infractions lose their adverse weight over time, rewarding operators who resume consistent compliance. By also incorporating proportional default severity and recurrence penalties, the model captures both the magnitude and persistence of non-compliance events. These design elements collectively create a balanced, forward looking compliance metric suited for continuous monitoring.

## Conclusion

This paper presents a novel Compliance Scoring Framework that addresses a critical need for standardized, data driven regulatory assessment in India's telecom sector. The model's key contributions include:

1. **Innovative Composite Metric:** Integration of multidimensional compliance indicators into a single, 0–100 scale with clear interpretive bands (Excellent to Poor).
2. **Temporal and Severity Adjustments:** Advanced decay and proportional penalty mechanisms that differentiate between one off defaults and chronic risk.
3. **Scalability and Practicality:** Excel based implementation enabling rapid deployment, customization, and potential integration with automated data feeds.
4. **Stakeholder Utility:** Relevance for regulators (risk based supervision), financial institutions (credit risk assessment), policymakers (evidence based planning), and licensees (performance benchmarking).

Future research may explore **machine learning** techniques to dynamically calibrate weights, incorporate real time network performance metrics, and integrate user generated quality of service data. Pilot implementation by in one of the PCCA zones, followed by stakeholder feedback loops, will be critical to refine the framework and inform national rollout. Ultimately, embedding the Compliance Score into licensing guidelines and financial evaluation practices can elevate compliance standards, foster financial inclusion and support the sustainable growth of India's telecommunications ecosystem.

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## Author's Profile

**Shri Nikhil Srivas** is Joint Controller (Administration/Revenue/Pension) in the Office of Principal CCA, Delhi, Department of Telecommunications, Government of India. He specializes in revenue assessment, pension management, and internal audit within one of the country's most complex telecom regulatory environments. With extensive experience overseeing revenue collection exceeding INR 20,000 crore and managing pension disbursement for over 35,000 beneficiaries, Shri Srivas has pioneered several stakeholder outreach and digital assistance initiatives, including the acclaimed PRACHI and SPREAD programmes, and established India's first DoT pensioners WhatsApp helpline. He has contributed to numerous high-level committees focused on financial recovery, digital transformation, and compliance reduction, and has published departmental reports and articles on audit risk, social impact, and data analysis. Shri Srivas is deeply committed to leveraging technology and policy innovation to enhance public service delivery in the telecom sector.