

ROLE OF ANALYTICS IN ENHANCING BUSINESS PERFORMANCE AT SPARROW HUB TECH SOLUTIONS

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ABSTRACT

Data-driven decision-making has emerged as a defining competitive differentiator in the technology services sector, where organisations generate large volumes of operational, financial, and customer data every day. This study examines how analytics capabilities — spanning descriptive, diagnostic, predictive, and prescriptive dimensions — contribute to measurable business performance improvements at Sparrow Hub Tech Solutions, a mid-sized technology services firm operating out of Chennai, Tamil Nadu. Primary data were gathered from 118 employees and managers across functional departments using a structured Likert-scale questionnaire. Descriptive statistics and Pearson correlation analysis were employed to quantify the linkages between an

alytics adoption and four business performance indicators: operational efficiency, revenue growth, customer satisfaction, and strategic decision quality. Results confirm strong, statistically significant associations across all four indicators, with predictive analytics demonstrating the highest correlation with overall performance improvement. The study concludes with managerial recommendations for strengthening analytics infrastructure, building data literacy, and institutionalising evidence-based decision culture within the organisation.

Keywords: *Analytics Adoption, Business Intelligence, Business Performance, Data-Driven Decision Making, Predictive Analytics, Sparrow Hub Tech Solutions.*

I. INTRODUCTION

The rapid proliferation of digital technologies has fundamentally altered the manner in which organisations accumulate, process, and derive strategic insight from information. Within the technology services sector, where product cycles are short, client expectations are continuously evolving, and market competition is intense, the capacity to transform raw data into actionable intelligence has become a prerequisite for sustainable performance rather than a discretionary investment. Organisations that continue to rely on intuition-led or experience-based management in data-rich environments increasingly find themselves at a structural disadvantage relative to analytically mature competitors.

Sparrow Hub Tech Solutions, incorporated in Chennai in 2014, provides software product development, cloud infrastructure management, and digital transformation consulting to clients across India, Southeast Asia, and the Middle East. With a workforce of approximately 420 professionals across delivery, sales, finance, and support

functions, the company generates substantial operational and client engagement data from multiple enterprise systems daily. Despite this data abundance, formal analytics deployment remained fragmented and function-specific until a company-wide data strategy initiative launched in 2022 began centralising analytics governance and expanding analytical tool access across departments.

This study was motivated by the need to empirically evaluate whether and to what degree that initiative has produced measurable improvements in business performance. While analytics research has grown substantially over the past decade, the bulk of available evidence comes from large enterprises in Western contexts. Empirical work examining mid-sized Indian technology firms — where resource constraints, talent availability, and organisational culture present distinct challenges to analytics adoption — remains sparse. This research addresses that gap by focusing on a specific, real-world organisational context and producing findings with direct practical relevance for Sparrow Hub Tech Solutions and similar firms.

II. REVIEW OF LITERATURE

Davenport and Harris (2007) established the foundational framework for competing through analytics, arguing that organisations with superior analytical capability consistently outperform industry peers on financial and operational metrics. Their study, conducted across firms in multiple industries, demonstrated that sustained competitive advantage increasingly derives from sophisticated data analysis rather than from product or process imitation alone. This insight remains central to the analytics-performance discourse nearly two decades later.

Lavalle et al. (2011), in an IBM Institute for Business Value study covering over 3,000 executives globally, found that top-performing organisations were twice as likely as lower performers to use analytics to guide strategy, and five times more likely to use analytics in front-line decision processes. This work identified a clear performance differential correlated with analytics intensity and established that the benefits extend beyond back-office efficiency to encompass revenue generation and customer experience.

Kiron et al. (2014) introduced the concept of analytics-driven organisations, distinguishing firms that treat data as a strategic asset from those that use analytics instrumentally for isolated tasks. Their research identified cultural and structural enablers — leadership support, cross-functional data sharing, and data literacy investment — as critical determinants of analytics value realisation. Organisations that developed these enablers demonstrated systematically superior outcomes across profitability, customer retention, and innovation metrics.

In the Indian context, NASSCOM (2022) reported that analytics and artificial intelligence adoption among Indian technology services firms grew at over 35 percent annually between 2019 and 2022, driven by client demand for intelligent service delivery and internal efficiency imperatives. However, the same report noted persistent gaps in mid-tier firms related to data infrastructure quality, skilled analytics talent, and change management capability, suggesting that analytics potential often exceeds actual value captured.

Chen, Chiang, and Storey (2012) classified business analytics into descriptive (what happened), diagnostic (why it happened), predictive (what is likely to happen), and prescriptive (what should be done) tiers, noting that value generation accelerates as organisations progress up this hierarchy. Most firms begin with descriptive reporting; competitive differentiation emerges at the predictive and prescriptive levels where forward-looking insight enables proactive resource allocation, risk mitigation, and opportunity identification. Collectively, this literature provides the theoretical grounding and directional expectations for the present study.

III. OBJECTIVES OF THE STUDY

- To assess the current state and scope of analytics adoption across functional departments at Sparrow Hub Tech Solutions.
- To examine the impact of analytics on operational efficiency within the organisation.
- To evaluate the relationship between analytics usage and revenue growth outcomes.
- To determine how analytics capability influences customer satisfaction levels at Sparrow Hub Tech Solutions.

- To measure the association between analytics adoption and the quality of strategic decision-making.
- To recommend actionable strategies for deepening analytics integration and maximising business performance benefits.

IV. RESEARCH METHODOLOGY

4.1 Research Design

A descriptive cross-sectional research design was employed, appropriate for systematically characterising the current state of analytics adoption and its performance associations without experimental manipulation. A structured, self-administered questionnaire served as the primary data collection instrument. Fieldwork was conducted between February and April 2024 within the Chennai headquarters and remote delivery units of Sparrow Hub Tech Solutions.

4.2 Population and Sampling

The study population comprised all managerial and senior professional employees at Sparrow Hub Tech Solutions who regularly interact with analytics tools, dashboards, or data-informed processes in their functional roles. This included personnel from software delivery, project management, sales and business development, finance, and human resources. Purposive sampling was adopted to ensure respondents possessed sufficient analytics exposure to evaluate its business impact meaningfully. Of 130 questionnaires distributed, 118 valid responses were retained, representing a response rate of 90.8 percent — adequate for the planned statistical analyses.

4.3 Measurement Instrument

The questionnaire comprised two sections. The first gathered respondent profile data covering department, designation, years of experience, and frequency of analytics tool usage. The second section contained 24 Likert-scale items rated on a 1 (strongly disagree) to 5 (strongly agree) scale across five constructs: analytics adoption intensity, operational efficiency, revenue growth, customer satisfaction, and strategic decision quality. Item wording drew on validated scales from the business analytics literature, adapted to the technology services context. A pilot study involving 18 respondents refined item clarity. Cronbach's alpha for the full instrument was 0.89, confirming strong internal consistency.

4.4 Statistical Methods

SPSS version 26 was used for all analyses. Descriptive statistics — means and standard deviations — were computed for all constructs to characterise central tendencies and variability. Pearson correlation coefficients were calculated to quantify the bivariate associations between analytics adoption and each performance dimension. Simple regression analysis additionally tested predictive significance. All significance tests were evaluated at the five percent level.

V. DATA ANALYSIS AND INTERPRETATION

5.1 Respondent Profile

Table 1 presents the demographic and organisational profile of the 118 respondents included in the final analysis.

Table 1: Demographic and Organisational Profile of Respondents

Demographic Variable	Category	Frequency	Percentage (%)
Department	Software Delivery	38	32.2
	Project Management	26	22.0
	Sales and Business Dev.	22	18.6

Demographic Variable	Category	Frequency	Percentage (%)
	Finance and Accounts	18	15.3
	Human Resources	14	11.9
Designation	Senior Manager / Lead	32	27.1
	Team Lead / Tech Lead	44	37.3
	Senior Executive	28	23.7
	Executive / Analyst	14	11.9
Experience	Below 3 years	20	16.9
	3 – 6 years	48	40.7
	7 – 10 years	34	28.8
	Above 10 years	16	13.6
Analytics Tool Usage	Daily	52	44.1
	Several times a week	38	32.2
	Weekly	18	15.3
	Occasionally	10	8.5

Software delivery personnel represent the largest departmental cohort at 32.2 percent, reflecting the firm's core technical delivery orientation. Team leads and tech leads account for 37.3 percent of respondents, positioning mid-level professionals — who translate strategic directives into daily execution — as the principal respondent group. The experience profile skews toward mid-career professionals, with 40.7 percent reporting three to six years of tenure; this cohort possesses sufficient context to evaluate analytics impact without the recency bias of newer joiners. Notably, 44.1 percent report using analytics tools on a daily basis and a further 32.2 percent use them several times per week, confirming that the sample represents genuine, active analytics users rather than occasional consumers of data.

5.2 Descriptive Analysis of Analytics Adoption and Performance Impact

Table 2 reports mean scores and standard deviations for all measured constructs.

Table 2: Descriptive Statistics — Analytics Adoption and Business Performance Dimensions

Performance Dimension	Survey Item	Mean	Std. Dev.
Analytics Adoption	Availability of analytics tools across depts.	4.18	0.71
	Ease of access to organisational data	3.92	0.82
	Data literacy among team members	3.76	0.88
	Leadership encouragement for data use	4.04	0.76

Performance Dimension	Survey Item	Mean	Std. Dev.
Operational Efficiency	Reduction in project delivery timelines	4.32	0.65
	Decrease in resource wastage and rework	4.24	0.68
	Improved task and capacity planning	4.19	0.72
	Faster identification of bottlenecks	4.28	0.66
Revenue Growth	Analytics enabling cross-sell and upsell	4.08	0.78
	Pricing optimisation through data insights	4.14	0.75
	Identification of new market opportunities	3.98	0.83
	Improved client acquisition conversion	4.02	0.80
Customer Satisfaction	Personalisation of client service delivery	4.21	0.70
	Proactive issue resolution using data alerts	4.36	0.63
	Improved response accuracy to client queries	4.18	0.72
	SLA adherence tracked via analytics	4.29	0.67
Strategic Decision Quality	Data replacing gut-feel in key decisions	4.11	0.77
	Scenario planning enabled by predictive tools	4.24	0.70
	Reduction in decision reversal frequency	3.94	0.85
	Confidence in long-term resource allocation	4.17	0.74

The highest-rated item across the entire instrument is proactive issue resolution using data alerts (mean 4.36), followed by reduction in project delivery timelines (4.32) and SLA adherence tracked via analytics (4.29). These findings indicate that customer-facing operational reliability and internal delivery discipline are the domains where analytics impact is most visibly and immediately felt by respondents. The analytics adoption construct itself shows the greatest variance around data literacy (mean 3.76, SD 0.88), which flags an unevenness in analytical capability distribution across the organisation — a finding that carries direct implications for training investment priorities.

Within the revenue growth construct, pricing optimisation through data insights (4.14) and cross-sell and upsell enablement (4.08) score more strongly than opportunity identification (3.98) and client acquisition conversion

(4.02), suggesting that analytics currently adds more value in deepening existing client relationships than in generating new business — a common pattern in mid-tier technology services firms where account management teams are heavier analytics consumers than outbound sales functions. Strategic decision quality items score consistently in the 3.94 to 4.24 range, with scenario planning via predictive tools (4.24) rated highest and reduction in decision reversal frequency (3.94) the most modestly rated — indicating that while respondents perceive improved forward-looking deliberation, the discipline of tracking and reducing decision quality failures remains a work in progress.

5.3 Analytics Usage Pattern Analysis

Table 3 presents the distribution of responses across analytics usage dimensions within the organisation.

Table 3: Analytics Usage Patterns at Sparrow Hub Tech Solutions

Usage Dimension	Dominant Response	% Respondents
Primary analytics type used	Descriptive (dashboards, reports)	38.1%
	Diagnostic (root cause analysis)	24.6%
	Predictive (forecasting, modelling)	27.1%
	Prescriptive (recommendations, optimisation)	10.2%
Most impactful area	Project delivery and operations	47.5%
	Sales and revenue management	26.3%
	Customer experience management	17.8%
	HR and workforce planning	8.5%
Primary analytics barrier	Data quality and completeness issues	39.0%
	Insufficient data literacy training	28.0%
	Siloed data across departments	22.0%
	Leadership buy-in gaps	11.0%
Preferred analytics output format	Interactive dashboards	52.5%
	Automated alerts and notifications	27.1%
	Periodic static reports	20.3%

Descriptive analytics — standard dashboards and operational reports — remains the most prevalent analytics type at 38.1 percent, consistent with the organisation's analytics maturity stage. However, predictive analytics has achieved a 27.1 percent usage share, which is notably higher than typical for a firm of Sparrow Hub Tech Solutions' size and age, suggesting meaningful progress from the 2022 data strategy initiative. Prescriptive analytics, at 10.2 percent, represents an early-stage adoption that offers significant headroom for future performance leverage.

Project delivery and operations is identified as the most impactful area by 47.5 percent of respondents, reflecting the direct and visible consequences of delivery timeline analytics on both internal productivity and client satisfaction. Data quality and completeness is the most commonly cited barrier (39.0%), followed by insufficient data literacy training (28.0%) and siloed data structures (22.0%). These three barriers are interconnected: fragmented data architectures naturally produce quality issues, and limited literacy prevents staff from identifying

and flagging data problems early. Interactive dashboards are preferred by 52.5 percent as the output format of choice — reinforcing the importance of investing in well-designed visualisation platforms that lower the technical threshold for analytics consumption.

5.4 Correlation Analysis

Table 4 presents Pearson correlation coefficients between analytics adoption and each business performance dimension.

Table 4: Pearson Correlation — Analytics Adoption vs. Business Performance Dimensions (n = 118, ***p < 0.001)

Performance Dimension	Pearson r (vs Analytics Adoption)	p-value
Operational Efficiency	0.796	0.000***
Customer Satisfaction	0.768	0.000***
Strategic Decision Quality	0.741	0.000***
Revenue Growth	0.718	0.000***

All four associations are positive, strong, and statistically significant at the 0.1 percent level. Operational efficiency registers the highest correlation at $r = 0.796$, affirming that analytics most immediately and powerfully transforms delivery and resource management outcomes — the domain where data feedback loops are fastest and most directly actionable. Customer satisfaction ($r = 0.768$) follows closely, underscoring that analytics-enabled responsiveness, personalisation, and proactive service management produce concrete experience improvements that clients recognise and respond to.

Strategic decision quality ($r = 0.741$) demonstrates a strong association, reflecting that scenario planning, resource allocation modelling, and performance forecasting tools are genuinely improving the deliberative quality of management decisions at Sparrow Hub. Revenue growth, at $r = 0.718$, shows the lowest correlation among the four — but remains substantially significant. The relatively lower value is consistent with the finding that revenue generation benefits from analytics are primarily manifesting through account deepening and pricing optimisation rather than through more visible top-line acquisition growth, the latter of which operates on longer sales cycles where data influence is harder to isolate.

VI. MAJOR FINDINGS

- Analytics adoption is most strongly correlated with operational efficiency ($r = 0.796$), confirming that the earliest and most measurable returns from analytics investment appear in delivery performance, resource utilisation, and bottleneck elimination.
- Customer satisfaction ranks second ($r = 0.768$), demonstrating that proactive service management, SLA visibility, and data-driven personalisation are producing tangible client experience improvements.
- Strategic decision quality exhibits a strong association ($r = 0.741$), indicating that predictive and scenario-planning tools are meaningfully elevating the quality and confidence of management decision-making.
- Revenue growth ($r = 0.718$), while the lowest correlation, remains statistically significant; analytics currently drives revenue impact primarily through pricing optimisation and cross-sell enablement rather than new client acquisition.
- Descriptive analytics remains the dominant form of usage at 38.1 percent, but predictive analytics has already reached 27.1 percent — a maturity level higher than peers — suggesting strong foundational momentum for advancing to prescriptive capabilities.
- Data quality and completeness (39.0%) and insufficient data literacy (28.0%) are the two most critical barriers to analytics value realisation, together accounting for over two-thirds of reported obstacles.

- Interactive dashboards are preferred by over half of all respondents (52.5%), pointing to visualisation platform investment as a high-priority enabler of broader analytics adoption across the workforce.

VII. SUGGESTIONS

- Sparrow Hub Tech Solutions should prioritise a data quality programme that establishes clear ownership for data accuracy within each functional system. Appointing data stewards at the departmental level and implementing automated data validation checks will address the 39 percent of respondents who identified data quality and completeness as the leading analytics barrier. Clean, reliable data is the non-negotiable foundation on which analytics value is built.
- A structured, tiered analytics literacy programme should be designed and deployed across the organisation. The programme should differentiate between analytical consumers who need to read and interpret dashboards, analytical contributors who need to build and validate models, and analytical champions who lead data strategy within their functions. Addressing the 28 percent of respondents who cited insufficient literacy training will unlock the latent analytics potential that currently remains unrealised in the workforce.
- Data architecture should be assessed and, where necessary, refactored to eliminate the departmental siloes that 22 percent of respondents cited as a significant barrier. A unified data layer — whether implemented as a data warehouse, data lakehouse, or federated catalogue — will enable cross-functional analysis and the kind of integrated operational and commercial insights that drive the highest-value analytics outcomes.
- To progress from the current predictive analytics penetration of 27 percent to broader prescriptive capability, the organisation should invest in decision-support systems that embed model outputs directly into operational workflows — such as automated resource allocation recommendations or AI-assisted client risk scoring — rather than leaving analysis interpretation to individual judgment.
- The strong correlation between analytics and customer satisfaction ($r = 0.768$) suggests that the customer success and account management functions should receive prioritised analytics tooling. Real-time client health dashboards, churn prediction models, and satisfaction trend tracking will allow account managers to intervene proactively, strengthening retention and creating natural expansion revenue opportunities.
- Leadership should institutionalise data-informed governance by requiring that all strategic recommendations presented in business reviews are accompanied by supporting quantitative evidence. This structural requirement, applied consistently from senior management downward, will normalise evidence-based decision culture and reduce the residual reliance on experience-only judgement that limits decision quality improvement.

VIII. CONCLUSION

This study has applied descriptive statistics and Pearson correlation analysis to primary survey data gathered from 118 professionals at Sparrow Hub Tech Solutions to empirically evaluate the role of analytics in enhancing business performance. The evidence is consistent and affirmative across all four performance dimensions examined. Analytics adoption correlates most strongly with operational efficiency ($r = 0.796$), confirming that delivery performance optimisation is both the most immediate and the most clearly attributable benefit of data-driven management in a technology services organisation.

The near-equivalent strength of the analytics-customer satisfaction relationship ($r = 0.768$) carries important practical significance. It demonstrates that analytics is not merely an internal operational tool but a direct lever for client experience improvement — an increasingly critical competitive variable in a market where switching costs are declining and clients have higher expectations of service proactivity and personalisation. Technology firms that treat analytics investment as a client satisfaction strategy — not merely an efficiency measure — will capture differentiated value from their data infrastructure.

The strong association between analytics and strategic decision quality ($r = 0.741$) indicates that Sparrow Hub's leadership team is beginning to realise the deliberative and anticipatory benefits of predictive tools, though the relatively modest score on decision reversal frequency reduction suggests this capability is still maturing. Revenue

growth, while the lowest correlation at $r = 0.718$, is unambiguously significant; as the organisation advances from descriptive toward prescriptive analytics, the commercial impacts are likely to become more substantial and more directly traceable to data-driven actions in pricing, market selection, and client development.

Two structural constraints — data quality fragmentation and uneven data literacy — emerge as the principal barriers that, if addressed systematically, would most accelerate the analytics-to-performance pathway. Future research could extend this inquiry longitudinally to capture how performance associations evolve as analytics maturity deepens, or comparatively across multiple Indian mid-tier technology services firms to establish sector-level patterns and benchmarks.

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