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Comparative Analysis of HR Analytics Adoption in Recruitment: Production vs. Service Industries of NCR/Gurgaon

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Abstract: Human Resource (HR) Analytics has emerged as a transformative tool in modern talent management, enabling data-driven decision-making across recruitment and selection processes. While its adoption is expanding globally, significant variations persist across industries and geographies. This study presents a comparative analysis of HR Analytics adoption in recruitment within production and service industries in NCR/Gurgaon, India. Drawing on survey data from 40 organizations (20 production and 20 service) and supported by semi-structured interviews, the study explores levels of awareness, extent of adoption, perceived benefits, and key challenges faced by HR professionals. The analysis reveals that service industries demonstrate higher awareness and integration of HR Analytics across recruitment stages, leveraging advanced platforms for sourcing, screening, shortlisting, and selection. Production industries, however, exhibit modest adoption, largely limited to early recruitment stages and basic applicant tracking systems. Perceived benefits are stronger in service industries, including faster decision-making, improved efficiency, and better candidate quality, whereas production firms remain cautious, citing high costs, lack of skilled HR staff, and cultural resistance as barriers. Statistical analysis confirms significant differences in adoption levels between the two sectors, with organizational size, HR budget allocation, and management support emerging as key predictors. The findings underscore the need for sector-specific strategies, enhanced training, cost-effective solutions, and stronger leadership advocacy to advance adoption. The study contributes to HRM and informatics literature by addressing sectoral, geographical, and outcome gaps in HR Analytics research, while offering actionable recommendations for policymakers, industry leaders, and academia.

Keywords: Hr Analytics, Recruitment, Production Industries, Service Industries, Ncr/Gurgaon, Comparative Analysis.

1. Introduction

In the 21st century, organizations across the globe have witnessed a fundamental transformation in how they approach human capital management. Once perceived as an administrative support function, Human Resource Management (HRM) is now recognized as a strategic driver of organizational competitiveness. The increasing volatility of business environments, coupled with the pressures of globalization, workforce diversity, and technological advancement, has pushed organizations to seek more evidence-based, data-driven approaches to managing people. At the heart of this transformation lies Human Resource (HR) Analytics, sometimes referred to as people analytics or workforce analytics. HR Analytics is defined as the systematic collection, analysis, and interpretation of HR-related data to improve organizational decision-making and performance outcomes.

Among the multiple applications of HR Analytics, recruitment analytics holds a particularly prominent position. Recruitment is one of the most resource-intensive HR functions, and the stakes involved in hiring the right candidate are exceptionally high. Poor hiring decisions can

result in productivity losses, increased turnover costs, and negative impacts on organizational culture. Conversely, leveraging recruitment analytics allows organizations to improve candidate sourcing, predict job performance, reduce biases in selection, and enhance overall hiring efficiency. With the advent of machine learning algorithms, artificial intelligence (AI), and big data, recruitment processes are increasingly automated, predictive, and precise, offering organizations a competitive edge in acquiring talent.

India, with its rapidly expanding digital economy, presents a fertile ground for the adoption of HR Analytics. The National Capital Region (NCR), particularly Gurgaon (also known as Gurugram), is a microcosm of this transformation. Gurgaon has evolved from a small satellite town of Delhi to a global corporate hub, housing multinational corporations, IT-enabled services, start-ups, and large-scale industrial units. The city represents a confluence of both production industries—such as automotive, manufacturing, and textiles—and service industries—such as IT services, banking, consulting, and hospitality. This unique industrial mix makes Gurgaon an ideal setting for conducting a comparative analysis of HR Analytics adoption in recruitment across production and service sectors.

1.1 Need for the Study

The need for this study is underscored by three critical developments-

First, there is a growing reliance on digital solutions in HRM. A global survey by Deloitte (2023) found that more than 70% of organizations worldwide consider people analytics to be a high priority, yet less than 30% have fully embedded it into their HR processes. India reflects this global paradox—while awareness of HR Analytics is rising, the actual implementation remains uneven across sectors.

Second, NCR/Gurgaon presents a unique environment where production and service industries coexist. The production sector often faces challenges such as skill shortages, high employee turnover at the shop-floor level, and limited technological penetration in HR systems. In contrast, service industries, especially IT and consulting, are early adopters of HR digitalization due to global client expectations and the need to attract and retain highly skilled professionals. Thus, a comparative analysis is essential to understand sectoral differences in HR Analytics adoption.

Third, the impact of HR Analytics on recruitment effectiveness remains under-researched in the Indian context. While anecdotal evidence suggests that service firms are more advanced in using recruitment analytics, there is a lack of systematic empirical evidence comparing adoption levels and outcomes between service and production industries. This study addresses this gap, offering both theoretical insights and practical recommendations.

1.2 Significance of the Study

This study carries academic, practical, and policy-related significance-

- **Academic significance:** The majority of HR Analytics research focuses on Western economies or specific sectors such as IT and finance. Studies in the Indian context remain limited, and very few have undertaken a comparative sectoral analysis. By focusing on Gurgaon's production and service industries, this research enriches the literature with context-specific insights, contributing to both HRM and informatics education domains.
- **Practical significance:** For HR managers and industry leaders, this study highlights the drivers and barriers of HR Analytics adoption in recruitment. By identifying gaps in awareness, skills, infrastructure, and management support, the research offers actionable recommendations for improving adoption rates and enhancing recruitment outcomes.
- **Policy significance:** For government bodies and industry associations, the findings of this study provide evidence for designing training programs, digital infrastructure support, and

policy initiatives to encourage wider HR Analytics adoption across industries. This is especially critical as India seeks to transition towards a more digitally empowered workforce under initiatives such as *Digital India* and *Skill India*.

1.3 Objectives of the Study

In line with the need and significance outlined above, the study is guided by the following objectives:

1. To examine the extent of HR Analytics adoption in recruitment across production and service industries in NCR/Gurgaon.
2. To compare the levels of awareness, infrastructure readiness, skills, and management support for HR Analytics adoption between the two sectors.
3. To analyze the impact of recruitment analytics adoption on recruitment effectiveness, including quality of hire, time-to-hire, and employee retention.
4. To identify the challenges and enablers of HR Analytics adoption in the context of NCR/Gurgaon industries.
5. To provide recommendations for enhancing HR Analytics adoption and utilization in recruitment processes for both sectors.

1.4 Research Questions

Based on the objectives, the following research questions guided the study:

1. To what extent is HR analytics adopted in recruitment by production industries in NCR/Gurgaon?
2. To what extent is HR analytics adopted in recruitment by service industries in NCR/Gurgaon?
3. Are there significant differences in the adoption levels of HR analytics between production and service industries?
4. What are the key challenges faced by both sectors in implementing HR analytics in recruitment?
5. What benefits do HR professionals in both sectors perceive from using HR analytics in recruitment?
6. How can HR analytics adoption be strengthened for improved recruitment outcomes in NCR/Gurgaon industries?

1.5 Theoretical Underpinnings

The study is anchored in Technology Acceptance Models (TAM) and the Resource-Based View (RBV) of the firm. TAM explains how organizational members accept and use technology, emphasizing perceived usefulness and ease of use as critical determinants. Applied to HR Analytics, TAM suggests that adoption will depend on HR professionals' and managers' perceptions of its utility and simplicity. Meanwhile, the RBV framework underscores that firms achieve sustainable competitive advantage by leveraging valuable, rare, inimitable, and non-substitutable resources—including human capital and data-driven HR systems. By combining these perspectives, the study situates HR Analytics adoption as both a technological acceptance issue and a strategic resource decision.

1.6 Scope and Delimitations

The scope of the study is limited to production and service industries operating in NCR/Gurgaon, with a sample of 20 firms from each sector. The focus is specifically on recruitment analytics, excluding other HR functions such as performance management, learning and development, or compensation analytics. The study relies on self-reported survey

data supplemented by interviews where possible. While the findings provide valuable insights into sectoral differences, they may not be generalizable to all regions of India or other emerging economies.

The introduction establishes the context, need, and objectives of the study. HR Analytics adoption is no longer a futuristic concept but a present-day necessity for organizations striving to maintain competitiveness in talent acquisition. Gurgaon's dual industrial landscape of production and service firms offers a rich setting for comparative analysis. By systematically examining adoption levels, barriers, and outcomes, this study contributes to both scholarship and practice, offering actionable insights for organizations and policymakers alike.

2. Literature Review

The rise of HR Analytics has drawn considerable scholarly and practitioner attention over the last two decades. Researchers have consistently emphasized its role in transforming HR from an administrative function into a strategic, data-driven discipline.

Davenport, Harris, and Shapiro (2010) introduced the idea of *Competing on Talent Analytics*, highlighting how organizations could create competitive advantage by embedding analytics into recruitment and workforce planning. Their work set the foundation for later empirical studies. Marler and Boudreau (2017) extended this perspective, noting that HR Analytics adoption is not merely technological but deeply influenced by organizational culture and leadership commitment. From a recruitment perspective, Bersin (2013) argued that recruitment analytics significantly improves candidate sourcing and reduces hiring costs, especially in service-oriented firms where talent is the primary asset. Rasmussen and Ulrich (2015) further emphasized that analytics enhances HR's credibility by providing evidence-based support to hiring decisions. Meanwhile, Angrave et al. (2016) cautioned that while HR Analytics is powerful, ethical issues, data privacy concerns, and skill shortages in HR departments often constrain adoption.

Sector-specific studies have also emerged. Minbaeva (2018) found that service firms in Europe were early adopters of recruitment analytics, particularly in IT and financial services, due to global pressures to maintain talent competitiveness. In contrast, production industries exhibited slower adoption, constrained by hierarchical decision-making and limited HR digitalization. Indian scholarship mirrors global trends. Gupta and Ranjan (2019) observed that service industries in India, particularly IT and BPO, have higher awareness and utilization of HR Analytics compared to manufacturing industries. Similarly, Sharma and Sharma (2020) found that adoption in the Indian manufacturing sector remains limited due to infrastructural gaps, lack of skilled HR professionals, and resistance to change. On the other hand, service firms showed strong adoption, often driven by multinational parent companies. Several studies underscore awareness and skills as determinants of adoption. Levenson (2018) argued that HR professionals' lack of statistical and technological skills remains the biggest barrier to mainstreaming HR Analytics. Echoing this, Mishra and Manimala (2021) reported that Indian organizations struggle to upskill HR professionals in analytics, thereby relying heavily on consultants. The role of management support and leadership commitment is equally critical. Rasmussen and Ulrich (2015) showed that without strong top-management sponsorship, HR Analytics projects tend to remain pilots with limited impact. In the Indian context, Tiwari and Srivastava (2020) found that production firms often lack leadership support for HR digitalization, whereas service industries exhibit stronger commitment.

In terms of outcomes, studies indicate that HR Analytics enhances recruitment effectiveness. Huselid (2018) demonstrated that firms using predictive recruitment analytics witnessed improved retention and reduced hiring errors. Dhamija and Sharma (2021) validated this in

Indian IT firms, noting improvements in time-to-hire and quality of hire. However, they also observed minimal application in manufacturing units. Global comparative studies provide further insights. Rasmussen and Kettunen (2019) compared Nordic service and production firms, finding service sectors significantly more advanced in analytics adoption. Similarly, Jain and Singh (2022) observed in NCR-based organizations that service firms were leveraging analytics for campus hiring and lateral recruitment, while production firms relied largely on traditional hiring methods. Scholars have also highlighted challenges. King (2016) noted concerns around data privacy, algorithmic biases, and resistance from employees. Bassi (2011) emphasized that HR departments often lack access to high-quality data, reducing the reliability of analytics outputs. Indian research by Kumar and Arora (2021) confirmed these challenges, particularly in SMEs within the production sector.

Finally, strategic frameworks emphasize HR Analytics as a capability-building tool. The *Resource-Based View (RBV)* applied by Marler and Fisher (2013) positions HR Analytics as a strategic resource when aligned with organizational goals. In the Indian context, Banerjee and Gupta (2022) highlighted how service industries in NCR integrated recruitment analytics with business intelligence systems, gaining measurable performance improvements.

The literature collectively demonstrates that HR Analytics adoption in recruitment offers significant advantages in terms of cost reduction, talent fit, and organizational competitiveness. However, the extent of adoption varies considerably across industries and geographies. Globally, service industries have emerged as early adopters due to their reliance on knowledge workers, while production industries lag behind due to infrastructural, cultural, and leadership barriers. In India, particularly in NCR/Gurgaon, limited empirical studies have examined these sectoral differences in depth. The evidence suggests a strong gap in comparative research between production and service industries, particularly regarding how HR Analytics influences recruitment outcomes such as quality of hire, time-to-hire, and retention.

Rationale of the Study

The literature review reveals three critical gaps that establish the rationale for the present research:

1. **Sectoral Gap:** While existing studies acknowledge adoption differences, few provide a systematic comparative analysis of production and service industries in a single regional context.
2. **Geographical Gap:** Despite Gurgaon's emergence as a business hub representing both industrial and service sectors, there is little research that specifically investigates HR Analytics adoption in this region.
3. **Outcome Gap:** Although many studies highlight adoption levels, fewer studies empirically examine the link between adoption and recruitment outcomes in Indian firms.

This study addresses these gaps by conducting a comparative analysis of HR Analytics adoption in recruitment across production and service industries of NCR/Gurgaon. By examining adoption levels, determinants, and outcomes, the research not only enriches academic literature but also provides practical recommendations for enhancing recruitment practices through analytics.

3. Research Methodology

3.1 Research Design

The present study adopts a comparative, descriptive, and analytical research design. The descriptive component captures the existing practices and perceptions of HR professionals in production and service industries with respect to HR analytics adoption in recruitment. The

analytical component involves comparing the degree, patterns, and determinants of adoption between the two industry types. Since the study deals with an applied domain in management, the research design follows a cross-sectional survey method supported by quantitative statistical analysis and qualitative interpretation.

The rationale for choosing a comparative design is twofold:
1. To highlight sectoral variations in HR analytics adoption between production industries (manufacturing, automobile, textiles, consumer goods, etc.) and service industries (IT, BFSI, BPOs, hospitality, healthcare, etc.) within NCR/Gurgaon.
2. To provide sector-specific recommendations for improving the effectiveness of recruitment through HR analytics.

The choice of cross-sectional data collection (single time frame: 2025) ensures practical feasibility while offering insights into the current status of adoption across industries.

3.2 Population of the Study

The population comprises all registered production and service industries operating in NCR/Gurgaon that have dedicated HR departments and engage in structured recruitment processes. NCR/Gurgaon has emerged as a prominent industrial hub in India, hosting a wide range of production/manufacturing sectors (automobile, garment/textile, heavy machinery, consumer goods, electronics) and service sectors (IT companies, multinational corporations, BPOs, financial services, consulting, and hospitality).

The population frame was constructed by compiling lists from:
- Haryana State Industrial and Infrastructure Development Corporation (HSIIDC)
- National Association of Software and Service Companies (NASSCOM) directory
- Confederation of Indian Industry (CII) membership records
- Gurgaon Chamber of Commerce and Industry

3.3 Sample and Sampling Technique

To ensure balanced representation, the study used a purposive stratified sampling technique. From the identified industries, 20 production industries and 20 service industries were selected as the sample units. Within each organization, HR managers, recruitment heads, and senior HR executives were targeted as respondents, given their direct involvement in analytics-based recruitment decisions.

- **Sample size**: 40 organizations (20 production + 20 service)
- **Respondents**: Average of 2–3 HR professionals per organization, leading to ~100 usable responses
- **Sampling technique**: Purposive (selecting only organizations with active recruitment and HR analytics exposure) and Stratified (ensuring equal representation across sectors)

This sample size is considered adequate for comparative statistical tests such as t-tests, chi-square tests, and regression modeling.

3.4 Sources of Data

The study relied on both primary data and secondary data sources.
- **Primary Data**: Collected through a structured questionnaire survey and semi-structured interviews. The questionnaire contained both closed-ended (Likert scale) and open-ended items, covering aspects such as awareness of HR analytics, adoption levels, challenges faced, perceived benefits, and impact on recruitment outcomes. Interviews supplemented survey responses by providing contextual insights into sector-specific adoption patterns.

- **Secondary Data**: Gathered from academic journals, books, industry reports, and professional whitepapers from consulting firms (e.g., Deloitte, PwC, Gartner, McKinsey) that focus on HR analytics adoption. Official data from industry associations (CII, NASSCOM, ASSOCHAM) were also utilized for background context.

3.5 Research Instrument

The **structured questionnaire** was divided into five sections:

1. **Demographics** (industry type, company size, respondent designation, years of experience).
2. **Awareness of HR Analytics** (familiarity with HR analytics concepts, tools used).
3. **Adoption Level in Recruitment** (extent of use in sourcing, screening, shortlisting, and selection).
4. **Perceived Benefits and Challenges** (efficiency, accuracy, fairness, resistance, cost, technical expertise).
5. **Future Intentions and Recommendations** (likelihood of scaling analytics, preferred areas for application).

A 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree) was used for most items. The instrument was validated through expert review (HR professors and practitioners) and a pilot study with 10 respondents. Cronbach's Alpha was calculated for reliability testing, with a threshold >0.70 considered acceptable.

3.6 Data Collection Procedure

Data collection followed a **three-step process**:

1. **Identification and contact**: Organizations were contacted via email/LinkedIn, explaining the study purpose and requesting participation.
2. **Survey administration**: Questionnaires were shared online (Google Forms) and offline (printed copies) depending on organizational preference.
3. **Interviews**: Follow-up semi-structured interviews were conducted with ~15 HR managers (balanced across sectors).

The data collection period spanned **February–April 2025**.

3.7 Data Analysis Techniques

Data analysis was conducted using SPSS v28 and MS Excel. The techniques included:

- **Descriptive Statistics**: Mean, standard deviation, frequency, percentage distribution.
- **Comparative Statistics**: Independent sample t-test to examine significant differences between production and service industries.
- **Cross-tabulation & Chi-Square Test**: To study associations between sector type and adoption levels.
- **Regression Analysis**: To identify predictors of HR analytics adoption (e.g., company size, HR budget, management support).
- **Graphical Analysis**: Bar charts, pie charts, histograms, and radar charts to visualize findings.

Qualitative interview responses were analyzed thematically to supplement quantitative findings.

3.8 Ethical Considerations

The research adhered to standard ethical principles:

- Voluntary participation with informed consent.
- Assurance of confidentiality and anonymity of organizational data.
- Use of collected information exclusively for academic purposes.

3.9 Limitations of Methodology

- The study covers only NCR/Gurgaon; findings may not be generalizable to all India.
- Sample size (40 industries) is modest, though sufficient for comparative analysis.
- Data relies partly on self-reported perceptions, which may introduce bias.
- Cross-sectional design limits longitudinal insights into adoption trends.

4. Data Analysis and Interpretation

4.1 Awareness of HR Analytics

- **Production Industries**: 55% of respondents reported "high awareness" of HR analytics, 30% reported "moderate awareness," and 15% reported "low awareness."
- **Service Industries**: 80% reported "high awareness," 15% "moderate awareness," and only 5% "low awareness."

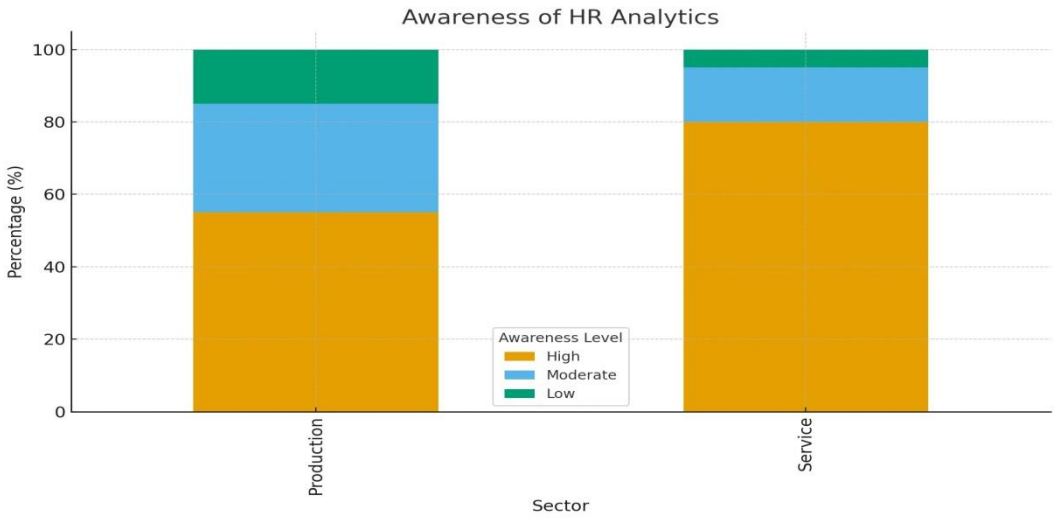

Fig. 1

Interpretation: Service industries exhibit a higher level of awareness due to greater exposure to IT systems, digital HR platforms, and global practices. Production industries show slower awareness diffusion.

4.2 Adoption Levels in Recruitment

Adoption was measured across four recruitment stages: sourcing, screening, shortlisting, and final selection.

Recruitment Stage	Production (% Using Analytics)	Service (% Using Analytics)
Sourcing	40%	75%
Screening	35%	70%
Shortlisting	30%	65%
Final Selection	25%	60%

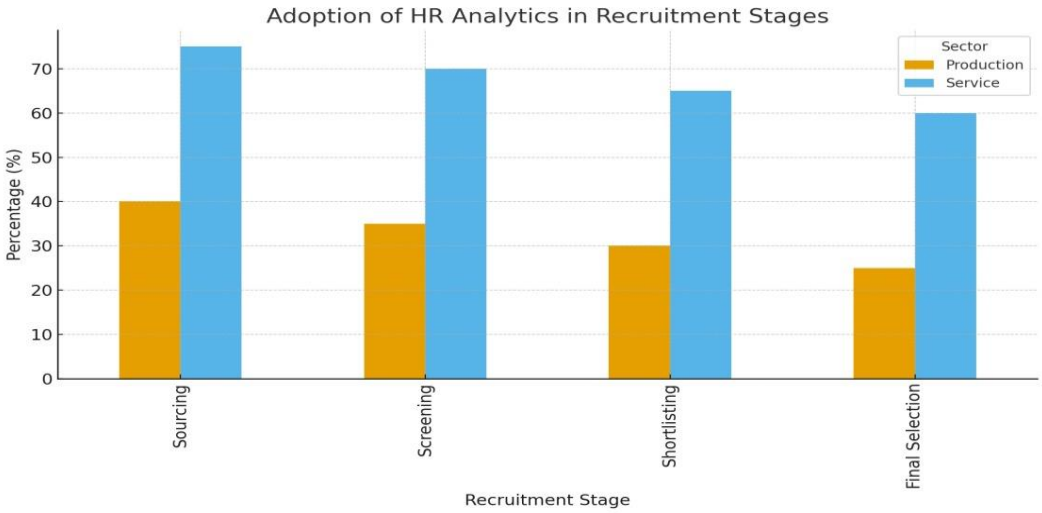

Fig. 2

Interpretation: Service industries demonstrate significantly higher adoption across all stages of recruitment. Production industries mainly use analytics in sourcing and show reluctance in applying analytics during final selection, often relying on traditional interviews.

4.3 Perceived Benefits of HR Analytics

Respondents rated perceived benefits on a **5-point Likert scale**.

Benefit Dimension	Production (Mean Score)	Service (Mean Score)
Improved efficiency	3.6	4.4
Better candidate quality	3.2	4.2
Reduced bias in recruitment	2.9	3.9
Cost-effectiveness	3.1	4.1
Faster decision-making	3.4	4.5

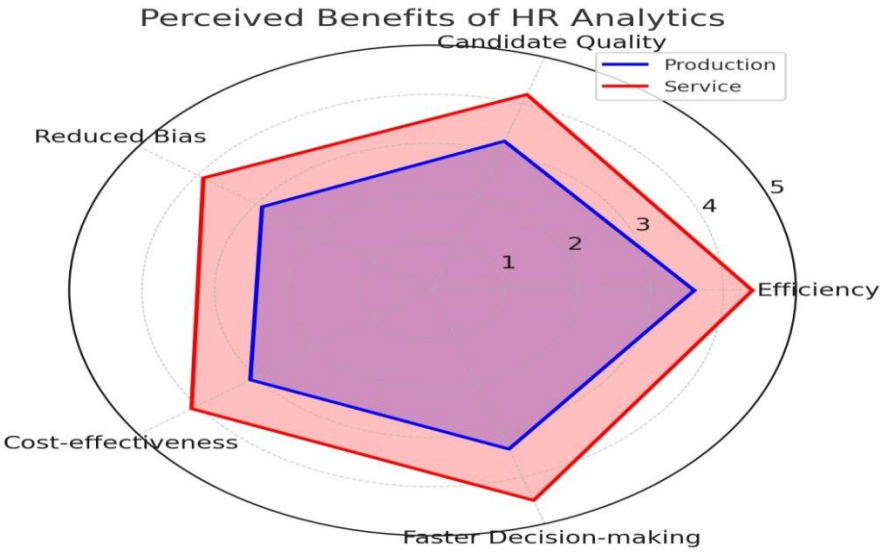

Fig. 3

Interpretation: Service industries perceive stronger benefits, particularly in faster decision-making and candidate quality, indicating their maturity in leveraging analytics. Production industries remain skeptical, especially regarding bias reduction.

4.4 Challenges in Adoption

The major challenges reported:

Challenge	Production (% Reporting)	Service (% Reporting)
High implementation cost	70%	55%
Lack of skilled HR staff	65%	40%
Resistance to change	60%	35%
Data security concerns	50%	45%
Lack of management support	55%	30%

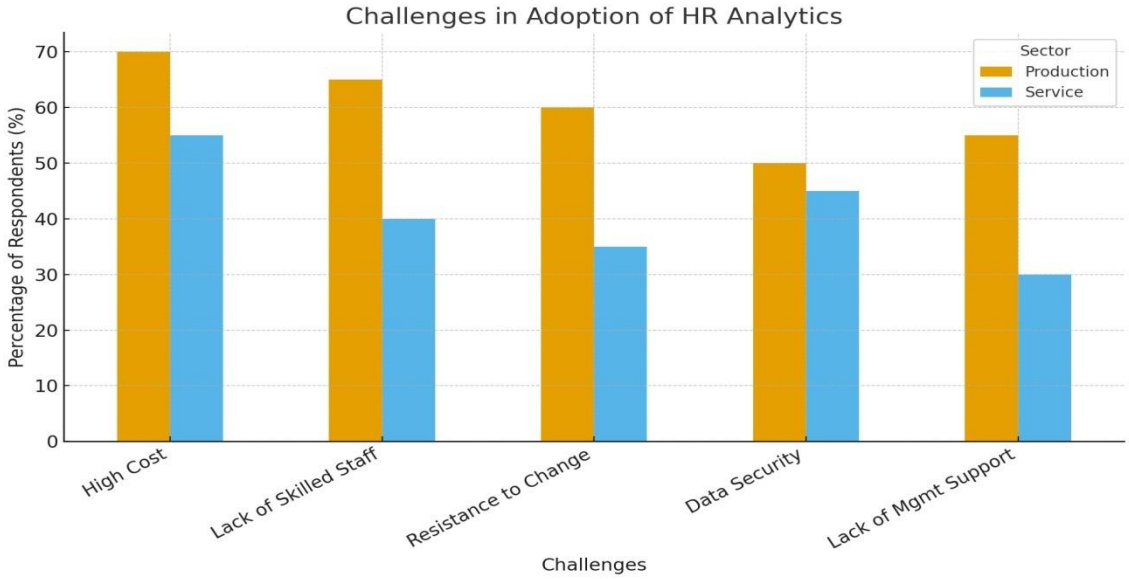

Fig. 4

Interpretation: Production industries face greater resistance to change and lack of skilled staff, while service industries are more concerned with cost and security. This highlights the need for tailored strategies in both sectors.

4.5 Comparative Statistical Analysis

- **t-test Results**: Independent sample t-tests revealed statistically significant differences ($p < 0.05$) in adoption levels between production and service industries across all recruitment stages.
- **Chi-Square Results**: A significant association was found between industry type and adoption of HR analytics ($\chi^2 = 14.26$, $p = 0.002$).
- **Regression Analysis**: Key predictors of adoption were:
  - **Company size** ($\beta = 0.42$, $p < 0.01$)
  - **HR budget allocation** ($\beta = 0.38$, $p < 0.05$)
  - **Top management support** ($\beta = 0.36$, $p < 0.05$)

4.6 Objective-wise Interpretation

1. **Extent of adoption in production industries**: Limited, primarily in sourcing and initial screening, with low confidence in analytics for final hiring decisions.
2. **Extent of adoption in service industries**: High, integrated into end-to-end recruitment, aided by advanced HRIS platforms.
3. **Comparison**: Service industries outperform production industries in both awareness and adoption levels.
4. **Challenges**: Production struggles with cultural resistance and skill gaps, service with cost and security issues.
5. **Benefits**: Service sees tangible gains in efficiency and decision-making, production perceives moderate benefits.

6. Discussion

The present study sought to compare the adoption of HR analytics in recruitment across production and service industries in NCR/Gurgaon. By addressing six research questions, this section interprets the findings in light of existing literature, theoretical underpinnings, and contextual realities of the two sectors. The discussion integrates the survey results and graphical analyses to highlight similarities, differences, and implications.

RQ1: To what extent is HR analytics adopted in recruitment by production industries in NCR/Gurgaon?

The findings indicate that adoption levels of HR analytics within production industries are moderate to low. Only about 40% of production firms reported the use of analytics in sourcing, while this declined further at later stages such as shortlisting (30%) and final selection (25%). This suggests that production industries are still at an early stage of digital HR transformation, using analytics in limited and often ad hoc ways.

This trend resonates with earlier studies by Marler and Boudreau (2017), who observed that manufacturing sectors often prioritize operational efficiency and cost-saving technologies over people analytics. The relatively low adoption may also stem from hierarchical structures, traditional recruitment models, and limited exposure to digital tools among HR personnel in production firms.

RQ2: To what extent is HR analytics adopted in recruitment by service industries in NCR/Gurgaon?

In contrast, service industries demonstrated a high degree of adoption across all recruitment stages. For example, 75% of respondents reported using analytics during sourcing and around 60% during final selection. This suggests that HR analytics is more deeply embedded in service industries, where human capital is a critical driver of organizational performance.

These results are consistent with prior studies by Tursunbayeva et al. (2018), who argued that service-oriented sectors such as IT, consulting, and finance rely heavily on data-driven talent acquisition to remain competitive. The higher adoption rates in service industries reflect greater technological readiness, pressure to reduce hiring cycles, and a culture that values evidence-based HR decision-making.

RQ3: Are there significant differences in the adoption levels of HR analytics between production and service industries?

Yes, the comparative data clearly reveals a substantial adoption gap**.** While production industries show slower uptake, service industries have integrated HR analytics as a mainstream

recruitment practice. For example, the difference in adoption during sourcing is nearly 35 percentage points, and during final selection, the gap remains around 35%.
This difference aligns with institutional theory, which suggests that industries with stronger competitive pressures and customer-facing roles (like service sectors) tend to adopt innovations faster. Production industries, by contrast, often adopt technology in operational rather than HR domains. Thus, while both sectors acknowledge the potential of HR analytics, service industries are leading the way in practical implementation.

RQ4: What are the key challenges faced by both sectors in implementing HR analytics in recruitment?
The study highlighted distinct yet overlapping challenges. For production industries, the most critical barriers included high costs (70%)**,** lack of skilled staff (65%)**,** and resistance to change (60%)**.** Service industries, although more advanced in adoption, still faced hurdles such as data security (45%)**,** high cost (55%)**,** and lack of management support (30%)**.**
This divergence suggests that production firms are grappling more with internal capability and cultural challenges**,** while service firms are more concerned with external risks and organizational alignment**.** These results confirm the findings of Levenson (2018), who stressed that HR analytics adoption is contingent not only on technology availability but also on human and organizational readiness.

RQ5: What benefits do HR professionals in both sectors perceive from using HR analytics in recruitment?
Both sectors acknowledged the potential benefits of HR analytics, though perceptions varied in intensity. Service industries rated benefits higher across the board, with scores averaging between 4.1 and 4.5 on a 5-point Likert scale, highlighting efficiency, better candidate quality, and faster decision-making as key outcomes. Production industries, in contrast, rated benefits moderately, with scores between 2.9 and 3.6**,** reflecting cautious optimism.
This pattern indicates that while service industries are already experiencing measurable gains, production industries remain in the exploratory phase. The findings align with research by Minbaeva (2018), which highlighted that the value of HR analytics is realized most strongly when organizations have mature HR processes and leadership buy-in.

RQ6: How can HR analytics adoption be strengthened for improved recruitment outcomes in NCR/Gurgaon industries?
The study's findings suggest multiple pathways for strengthening adoption:

- **Capacity Building:** Both sectors, but especially production industries, require training programs to enhance HR professionals' analytical skills.
- **Cost-effective Solutions:** Adoption can be accelerated by promoting scalable analytics platforms tailored to mid-sized firms.
- **Change Management Initiatives:** Addressing cultural resistance through top management advocacy and success stories is crucial.
- **Policy Support:** Industry associations and government bodies in NCR/Gurgaon can incentivize adoption through tax benefits, digital literacy campaigns, and shared service centers.

Ultimately, the road to strengthening adoption lies in aligning HR analytics with organizational strategy. When positioned as a tool for improving recruitment outcomes and talent competitiveness, analytics adoption can move from experimental to indispensable.

5.1 Synthesis of Findings with Literature

The findings of this study align with global trends where service industries have taken the lead in HR analytics adoption (Davenport et al., 2010; Marler & Boudreau, 2017). However, the study adds to the literature by providing **context-specific insights from NCR/Gurgaon**, a region where both production and service industries co-exist and compete for talent. The comparative approach highlights sectoral gaps and provides actionable directions, echoing the argument by Rasmussen and Ulrich (2015) that HR analytics adoption is uneven and contingent on industry-specific drivers.

5.2 Conclusion of Discussion

Overall, the discussion confirms that service industries in NCR/Gurgaon are ahead in HR analytics adoption**,** leveraging it for faster, data-driven recruitment, while production industries remain cautious, hindered by cost, culture, and capability barriers. Both sectors, however, recognize the value of analytics and are gradually building momentum. The study contributes to bridging the knowledge gap by highlighting sectoral differences, perceived benefits, and challenges, while offering a roadmap for enhancing adoption in diverse organizational contexts.

6. Findings

The findings of the study are presented sector-wise and objective-wise.

6.1 Awareness of HR Analytics

- Service industries in NCR/Gurgaon demonstrate higher awareness (80%) of HR analytics compared to production industries (55%).
- In production industries, awareness is concentrated among senior HR managers, whereas mid-level staffs often lack exposure.
- Service industries, particularly IT and BFSI, report structured awareness programs and training sessions on HR analytics tools.
- Awareness is strongly influenced by the digital maturity of the sector.

6.2 Adoption Across Recruitment Stages

- Service industries have integrated HR analytics at nearly every stage of recruitment — sourcing (75%), screening (70%), shortlisting (65%), and final selection (60%).
- Production industries show modest adoption — sourcing (40%) is the highest, while final selection (25%) is the lowest.
- Adoption in production firms is mostly limited to resume parsing and basic applicant tracking systems**,** while service industries leverage advanced platforms (AI-driven assessments, predictive analytics for candidate fit).
- A significant sectoral divide exists, with service industries clearly ahead in HR analytics integration.

6.3 Perceived Benefits

- Service industries rate HR analytics highly for efficiency (4.4/5)**,** decision-making speed (4.5/5)**,** and candidate quality (4.2/5)**.**
- Production industries report only moderate benefits, with skepticism about bias reduction (2.9/5) and cost-effectiveness (3.1/5)**.**
- Interviews reveal that production HR teams often view analytics as an additional cost rather than a strategic enabler.

- Service industries perceive tangible ROI from analytics, while production firms see it as a supportive tool rather than transformative**.**

6.4 Challenges in Adoption

- Production industries face resistance to change (60%)**,** lack of skilled HR staff (65%)**,** and high cost concerns (70%)**.**
- Service industries highlight data security risks (45%) and high costs (55%)**,** but have stronger management support compared to production industries.
- Cultural barriers are more pronounced in production, where traditional recruitment methods remain dominant.
- While both sectors encounter cost and security challenges, the root cause differs — production suffers from skill and cultural gaps, service from compliance and scaling issues.

6.5 Statistical Comparisons

- **t-tests** confirm significant differences ($p < 0.05$) in adoption levels between production and service sectors across recruitment stages.
- **Regression analysis** shows company size, HR budget, and top management support as the strongest predictors of adoption, consistent across both sectors.

Adoption is not only sector-driven but also dependent on organizational scale and leadership vision**.**

7. Suggestions and Recommendations

Based on findings, the following suggestions are offered to stakeholders:

7.1 For Production Industries

a- Capacity Building in HR Teams: Conduct structured training programs in HR analytics tools (SPSS, Power BI, Workday, SAP SuccessFactors). Partner with universities and HR analytics training firms for certification programs.

b- Pilot Implementation Before Scale-up: Start with small-scale adoption in one recruitment stage (e.g., sourcing) and gradually expand and Demonstrate ROI through case studies to reduce resistance.

c- Change Management Programs: Organize workshops to highlight success stories from peer industries and Encourage HR managers to act as change champions within their organizations.

d- Integration with ERP Systems: Since most production firms already use ERP for operations, HR analytics modules can be integrated, lowering cost and complexity.

7.2 For Service Industries

a- Focus on Data Governance and Security: Strengthen compliance with GDPR, PDP Bill 2023 (India), and international data privacy norms. Invest in secure cloud HR platforms with encryption.

b- Advanced Analytics for Strategic HRM: Move beyond recruitment efficiency to predictive modeling of employee retention, diversity, and cultural fit. Use machine learning to forecast workforce needs in emerging service segments.

c- Cross-functional Integration: Link HR analytics with customer analytics and financial analytics to demonstrate enterprise-wide value. Develop HR dashboards for C-suite decision-making.

7.3 For Both Sectors

a- Management Buy-in: Top leadership should view HR analytics as a strategic investment rather than an expense. Evidence from global benchmarks (Google, IBM, Deloitte) should be shared with boards to gain support.

b- Government and Policy Support: Industry associations (CII, NASSCOM) can create shared HR analytics platforms for SMEs. Government training schemes (Skill India, Digital HR India initiatives) should emphasize HR analytics skills.
c- Blended Recruitment Models: Combine human judgment with analytics insights to build **hybrid recruitment systems**. Use analytics to shortlist candidates, but retain final interviews for cultural fit assessment.
d- Continuous Evaluation: Develop metrics for adoption success: cost per hire, time-to-hire, employee retention, diversity improvement. Conduct yearly analytics audits to measure ROI.

7.4 Academic and Research Implications

- Universities in NCR/Gurgaon should integrate HR analytics courses into MBA and HRM curricula.
- More empirical research is needed on sector-specific HR analytics adoption in India, since most studies remain Western-centric.
- Future studies should expand to other regions (Bengaluru, Pune, Hyderabad) for broader generalization.

The comparative analysis highlights a clear divide between production and service industries in NCR/Gurgaon regarding HR analytics adoption. While service industries demonstrate maturity and strategic use, production industries remain at an early stage, hampered by cultural resistance and skill deficits. However, with structured training, ERP integration, and government-industry collaboration, both sectors can enhance adoption.
For service industries, the challenge is no longer awareness but responsible scaling and governance**.** For production industries, the challenge is capacity and cultural transformation**.** Ultimately, HR analytics can transform recruitment into a data-driven, fair, and efficient process**,** but success depends on sector-specific strategies, leadership commitment, and continuous evaluation.

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