

CHAPTER 1

GENERAL PEDAGOGY AND HISTORY OF PEDAGOGY

Competency-Based HR Analytics as a Driver of Employee Satisfaction and Performance in the IT Industry

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Abstract. The digital transformation of human resource management has increased the strategic importance of HR analytics in knowledge-intensive sectors. In the IT industry, where employee performance depends on rapidly changing technical and behavioural competencies, HR analytical tools can support not only monitoring and reporting but also competency identification, skill-gap analysis, personalized training, and career development. The objective of this article is to analyse how HR analytical tools influence employee satisfaction and performance in the IT industry when interpreted through a competency-based approach. The study applies a descriptive research design based on survey data collected from 278 IT employees working in Bangalore and Hyderabad. The questionnaire examined awareness of HR analytics, types of analytical tools used in organizations, HR functions supported by analytics, employee perceptions, performance improvements, skill-gap identification, data-driven evaluation, and personalized training. The interpretation is supported by an integrative review of peer-reviewed literature on HR analytics, people analytics, human capital analytics, competency development, and algorithm-based HR decision-making. The findings show that 77% of respondents are aware of HR analytics, 72% report the use of performance metrics systems, 76% believe that HR analytics helps identify skill gaps, and 68% confirm its use in designing personalized training programs. The results indicate that competency-based HR analytics can improve productivity, efficiency, accountability, goal alignment, employee development, and satisfaction when analytics is used as a developmental rather than purely controlling mechanism. Competency-based HR analytics should be understood as a strategic human capital development mechanism in the IT industry. Its effectiveness depends on data quality, analytical capability, ethical governance, transparency, employee trust, and integration with broader competency management systems.

Keywords: competency-based approach; HR analytics; people analytics; employee competencies; IT industry; employee satisfaction; performance management; skill gaps; personalized training; ethical HR analytics.

JEL Classification: J24; J28; M12; M15; M51; M53

Formulas: 0; **fig.:** 1; **tabl.:** 9; **bibl.:** 64

Introduction. The development of the digital economy has changed the role of human resource management in knowledge-intensive industries. In the IT sector, organizational competitiveness is determined not only by access to technologies, platforms, and financial resources but also by the quality, adaptability, and development potential of employee competencies. Software developers, data analysts, cybersecurity specialists, project managers, system architects, and other IT professionals work in an environment characterized by rapid technological change, project-based tasks, hybrid work, global competition, and permanent pressure for upskilling. Therefore, employee performance cannot be adequately explained only by formal job positions or standardized productivity indicators. It should be interpreted through the competencies that enable employees to solve complex tasks, collaborate in teams, innovate, learn continuously, and adapt to new technological requirements.

In this context, HR analytics becomes strategically important. However, its purpose should not be reduced to the collection of employee data, the construction of dashboards, or the automation of performance evaluation. When HR analytics is integrated with a competency-based approach, it becomes a mechanism for connecting workforce data with the real capabilities required for organizational development. This approach makes it possible to move from a narrow performance-control model to a developmental model in which data are used to identify competency gaps, design personalized learning programs, support career development, improve employee satisfaction, and align individual potential with organizational strategy.

The competency-based approach in human resource management emphasizes the systematic definition, assessment, development, and application of knowledge, skills, abilities, behavioural characteristics, and professional attitudes that determine effective performance. For IT organizations, this approach is especially relevant because technological competencies quickly become obsolete, while soft competencies such as communication, teamwork, critical thinking, adaptability, self-management, and client orientation remain essential for project success. HR analytics can help organizations understand not only what employees have already achieved but also which competencies they possess, which competencies require development, and which competencies will become critical in the future.

The original empirical focus of this study concerned the impact of HR analytical tools on employee satisfaction and performance in the IT industry. In this article, the analysis is strengthened through a competency-based interpretation of this relationship. Employee satisfaction and performance are considered not only as outcomes of HR analytical tools but also as results of the extent to which analytics supports fair evaluation, transparent development opportunities, personalized training, competency recognition,

and career mobility. Thus, HR analytics is examined as a bridge between data-driven decision-making and competency-based human capital development.

The relevance of this research is strengthened by several challenges faced by IT organizations: high employee mobility, skill shortages, rapid technological change, burnout, remote and hybrid work arrangements, and increasing dependence on project-based collaboration. These challenges require HR systems that can continuously monitor competency needs, predict future skill requirements, and support timely interventions. A competency-based HR analytics model can help organizations avoid fragmented HR practices and build a coherent system in which recruitment, onboarding, performance management, training, succession planning, and retention are connected through a shared competency framework.

Literature Review. HR analytics is commonly defined as the systematic collection, analysis, and interpretation of workforce data to improve HR decisions and organizational outcomes. Marler and Boudreau (2017) describe HR analytics as a field that can support evidence-based HRM, but they also note that the academic evidence base has historically been less developed than practitioner enthusiasm. Rasmussen and Ulrich (2015) similarly argue that HR analytics creates value only when it is connected to business problems and managerial decisions rather than treated as a fashionable reporting function.

People analytics and human capital analytics have also been discussed as organizational capabilities. Minbaeva (2018) emphasizes that credible human capital analytics requires the ability to combine high-quality data, analytical skills, managerial interpretation, and organizational action. Tursunbayeva, Di Lauro, and Pagliari (2018) show that people analytics has evolved through overlapping concepts and value propositions, including decision support, workforce planning, productivity improvement, and strategic HRM. These studies suggest that the value of analytics depends not only on data availability but also on organizational capacity to transform data into meaningful decisions.

Several studies have warned that HR analytics may fail if it remains disconnected from employee interests and ethical governance. Angrave, Charlwood, Kirkpatrick, Lawrence, and Stuart (2016) argue that HR analytics may not deliver transformational change if it prioritizes technical measurement over strategic and employee-centred questions. Leicht-Deobald et al. (2019) emphasize that algorithm-based HR decision-making raises ethical concerns related to personal integrity, transparency, monitoring, and employee autonomy. These concerns are highly relevant for competency-based analytics because competency data may influence promotion, training opportunities, performance ratings, and career trajectories.

The competency-based interpretation of HR analytics is closely related

to research on human capital investment in IT services. Bapna, Langer, Mehra, Gopal, and Gupta (2013) examined human capital investments in the IT services industry and showed that training can improve employee performance. Their findings support the assumption that organizations should not treat employee development as a general activity but should connect it to specific skills, competencies, and performance requirements. HR analytics can provide such connection by linking training records, project outcomes, performance indicators, and individual development needs.

Big data analytics and strategic human capital research also support this logic. Hamilton and Sodeman (2020) argue that big data analytics can help organizations address important strategic human capital questions, but only when organizations ask meaningful questions about people, capabilities, and value creation. Mikalef, Krogstie, Pappas, and Pavlou (2020) demonstrate that big data analytics capability contributes to competitive performance through dynamic and operational capabilities. Applied to HR analytics, this means that data-driven HR practices improve performance when they strengthen organizational capabilities rather than simply increase measurement intensity.

Existing literature confirms the growing importance of HR analytics but reveals several gaps. First, many studies analyse analytics from an organizational or managerial perspective, while employee-level interpretations remain less developed. Second, the literature often focuses on productivity, workforce planning, turnover prediction, or cost reduction, while the competency-development dimension receives less attention. Third, empirical studies rarely connect HR analytics directly with employee satisfaction, personalized training, skill-gap identification, and competency-based performance evaluation in the IT industry. Fourth, ethical discussions often address algorithmic HRM broadly, but less attention is paid to how competency data should be governed when it affects employee development and career opportunities.

This article addresses these gaps by placing the competency-based approach at the centre of the analysis. It interprets HR dashboards, predictive models, performance metrics, workforce analytics software, and learning analytics not only as instruments of control but also as tools for identifying, developing, and renewing employee competencies in IT organizations.

Aims. The aim of this study is to analyse how HR analytical tools influence employee satisfaction and performance in the IT industry when interpreted through a competency-based approach.

- To analyse employees' awareness and usage of HR analytical tools as instruments of competency identification and development in the IT industry.
- To determine which HR analytical tools are used to assess performance, identify skill gaps, and support competency-based HR decisions.

- To examine employee perceptions of HR analytical tools as mechanisms for fair evaluation, personalized training, and professional development.
- To determine the relationship between competency-oriented HR analytics and employee performance in IT organizations.
- To assess the extent to which HR analytics contributes to employee satisfaction through transparency, development opportunities, and recognition of competencies.
- To propose a competency-based interpretation of HR analytics as a developmental human capital mechanism.

The research hypotheses were formulated as follows: H01: employee awareness and usage of HR analytical tools do not significantly influence competency development and employee performance; H11: employee awareness and usage of HR analytical tools significantly influence competency development and employee performance; H02: different HR analytical tools have no significant impact on the identification and development of employee competencies; H12: different HR analytical tools have a significant impact on the identification and development of employee competencies; H03: employees' perceptions of HR analytical tools have no significant relationship with employee satisfaction and performance; H13: employees' perceptions of HR analytical tools have a significant relationship with employee satisfaction and performance.

Methodology. The study adopted a descriptive research design. This design is appropriate because the research aims to describe and analyse the relationship between HR analytical tools, competency-based HR practices, employee satisfaction, and employee performance in the IT industry. The research focuses on employees' awareness, usage, perceptions, and experience of HR analytics in relation to performance evaluation, skill-gap identification, and personalized training.

Primary data were collected from employees working in the IT sector in Bangalore and Hyderabad using a structured questionnaire. The questionnaire covered awareness of HR analytics, types of analytical tools used in organizations, duration of implementation, HR functions supported by analytics, perceived performance improvements, skill-gap identification, frequency of performance reporting, data-driven evaluation, and personalized training. Secondary sources were selected to support the theoretical interpretation of HR analytics, competency management, employee performance, ethical people analytics, and data-driven HRM.

The population of the study consisted of employees working in the IT industry. A total of 278 employees participated in the survey, and their responses were used for data analysis. Convenience sampling was applied due to accessibility and willingness of respondents to participate. The sample size was determined using Cochran's formula at a 95% confidence level. Data were analysed using descriptive statistics and interpreted in relation to the competency-based HR analytics framework.

The selection of literature prioritized academic relevance, methodological clarity, recency, citation value, and direct connection with the research topic. The analysis focused on four thematic areas: HR analytics and people analytics; competency-based HRM and human capital development; employee satisfaction and performance in knowledge-intensive industries; and ethical challenges of data-driven and algorithm-based HR decision-making.

The study has limitations. The sample was limited to 278 respondents from Bangalore and Hyderabad and therefore may not fully represent all IT employees or organizations. The study relied on self-reported questionnaire data, which may be influenced by subjective perceptions. The research focused on selected HR analytical tools and competency-related outcomes, while other factors such as leadership style, organizational culture, team climate, motivation, and compensation were not examined in depth.

Results. The empirical analysis is based on responses from 278 employees working in the IT industry. The results are interpreted through a competency-based approach, where HR analytics is viewed as a mechanism for identifying, developing, evaluating, and renewing employee competencies.

Table 1. Competency-based interpretation of HR analytical tools

HR analytical tool	Competency-based function	Expected employee-level outcome
HR dashboards	Visualization of competency, performance, learning, and engagement indicators	Greater transparency and awareness of development needs
Predictive modelling	Forecasting future competency shortages, turnover risks, and performance trends	Timely development interventions and better career planning
Performance metrics systems	Measurement of task completion, quality, productivity, and goal achievement	More objective evaluation and stronger accountability
Workforce analytics software	Integration of employee, project, training, and engagement data	Better alignment between employee competencies and organizational needs
Personalized learning analytics	Identification of skill gaps and recommendation of individual training paths	Higher competence development and employee satisfaction

Source: developed by the authors based on Marler and Boudreau (2017), Minbaeva (2018), Tursunbayeva et al. (2018), Bapna et al. (2013), and Leicht-Deobald et al. (2019).

Table 1 shows that the same analytical tools can be interpreted in two ways. They may function as control instruments when they are used only to monitor performance, or they may become competency-development instruments when they are connected with skill gaps, learning paths, feedback, and career development.

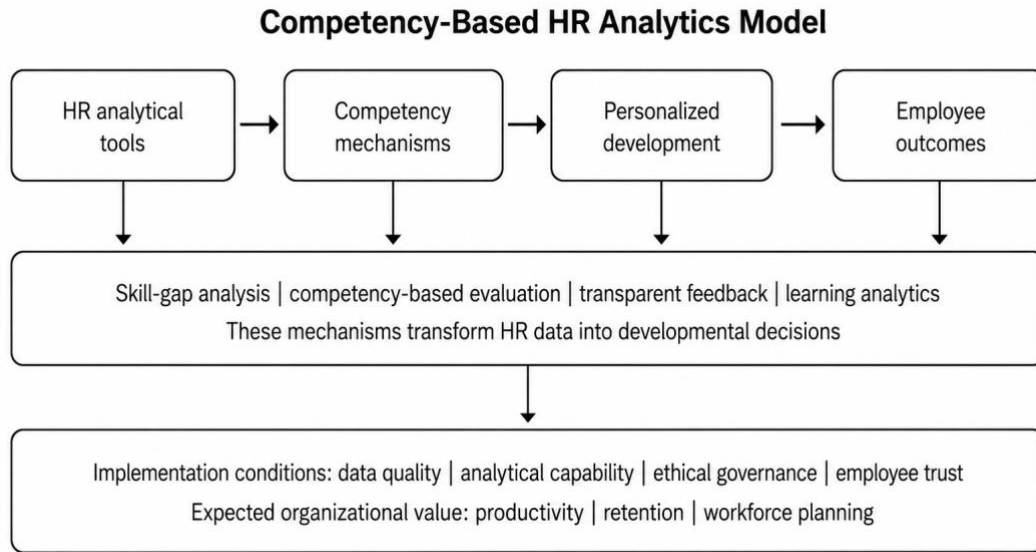


Figure 1. Competency-based HR analytics model in the IT industry

Source: developed by the authors based on Rasmussen and Ulrich (2015), Marler and Boudreau (2017), Minbaeva (2018), Bapna et al. (2013), and Leicht-Deobald et al. (2019).

Figure 1 summarizes the logic of the study. HR analytical tools influence employee outcomes through competency-based mechanisms. These mechanisms include skill-gap analysis, competency-based evaluation, transparent feedback, and learning analytics. However, the model also shows that the effectiveness of analytics depends on implementation conditions such as data quality, analytical capability, ethical governance, and employee trust.

Table 2. Awareness of HR analytics among respondents

Awareness of HR analytics	Frequency (N)	Percentage (%)
Aware	214	77
Not aware	64	23
Total	278	100

Source: developed by the authors based on survey data (n = 278).

The results show that 77% of respondents are aware of HR analytics, while 23% are not aware of such tools. From a competency-based perspective, awareness is important because employees can benefit from analytical systems only when they understand their purpose, criteria, and connection with development opportunities.

Table 3. HR analytical tools used in organizations

HR analytical tools	Frequency (N)	Percentage (%)
Predictive modelling	126	45
HR dashboards	178	64
Performance metrics systems	201	72
Workforce analytics software	149	54
Not sure	34	12

Source: developed by the authors based on survey data (n = 278; multiple responses were possible).

Performance metrics systems and HR dashboards are the most frequently used tools, with 72% and 64% respectively. These tools can support competency-based HRM when they are designed not only to measure outputs but also to show the competencies that contribute to performance.

Table 4. HR functions where analytics is most used

HR function	Frequency (N)	Percentage (%)
Recruitment	165	59
Performance management	201	72
Training and development	174	63
Employee engagement	142	51
Workforce planning	121	44

Source: developed by the authors based on survey data (n = 278; multiple responses were possible).

The data show that analytics is most often used in performance management, training and development, and recruitment. These three functions form the core of competency-based HRM because recruitment requires competency profiling, training requires skill-gap analysis, and performance management requires evaluation of how competencies are applied in real work situations.

Table 5. Improvement in employee performance after implementing HR analytics

Response	Frequency (N)	Percentage (%)
Yes	198	71
No	36	13
Not sure	44	16
Total	278	100

Source: developed by the authors based on survey data (n = 278).

A total of 71% of respondents believe that employee performance improved after implementing HR analytics. This result suggests that analytics can contribute to better performance when it supports clear goals, timely feedback, objective evaluation, and competency development.

Table 6. Performance areas improved due to HR analytics

Performance area	Frequency (N)	Percentage (%)
Productivity	184	66
Efficiency	173	62
Accountability	141	51
Goal alignment	156	56
Skill development	167	60

Source: developed by the authors based on survey data (n = 278; multiple responses were possible).

The most visible improvements concern productivity, efficiency, skill development, goal alignment, and accountability. These results support the argument that performance should be interpreted through competencies. Productivity and efficiency improve when employees possess the

competencies required for their tasks, while goal alignment improves when competency expectations are clear.

Table 7. HR analytics, skill gaps, data-driven evaluation, and personalized training

Indicator	Yes N (%)	No N (%)	Interpretation
HR analytics helps identify employee skill gaps	212 (76%)	66 (24%)	Analytics is used as a developmental mechanism
Performance evaluation is data-driven	196 (71%)	82 (29%)	Evaluation is increasingly evidence-based
HR analytics is used in personalized training	188 (68%)	90 (32%)	Analytics supports individual learning paths

Source: developed by the authors based on survey data (n = 278).

The finding that 76% of respondents believe HR analytics helps identify employee skill gaps is central to the competency-based interpretation of the study. Skill-gap identification is the point at which analytics becomes developmental rather than merely administrative. Similarly, data-driven evaluation and personalized training indicate that HR analytics can support fairer feedback and more targeted development when implemented transparently.

Table 8. Frequency of employee performance reports generated using HR analytics

Frequency	Frequency (N)	Percentage (%)
Monthly	118	42
Quarterly	96	35
Annually	38	14
As required	26	9
Total	278	100

Source: developed by the authors based on survey data (n = 278).

The majority of respondents report that performance reports are generated monthly or quarterly. Frequent reporting can support competency development if it is accompanied by feedback and learning recommendations. However, reporting may become counterproductive if it is used only for surveillance or control.

Discussion. The results demonstrate that HR analytics in IT organizations already performs several functions associated with competency-based HRM. The use of performance metrics systems, dashboards, training analytics, and skill-gap identification mechanisms shows that organizations are moving toward more evidence-based management of employee capabilities. However, the strategic effect of these tools depends on the way they are interpreted and applied. If HR analytics is limited to monitoring attendance, productivity, and task completion, its developmental potential remains restricted. If it is integrated with competency frameworks, it can become a tool for long-term human capital development.

The competency-based approach changes the meaning of employee performance. Performance is no longer treated only as a final result. It is viewed as the practical expression of competencies in a specific organizational context. This means that HR analytics should answer not only whether an employee performs well but also why this performance occurs, which competencies support it, which competencies are missing, and what development actions are needed. Such an interpretation is especially important in the IT industry because the same formal position may require different competency combinations depending on project complexity, client expectations, technology stack, and team composition.

Employee satisfaction is also closely connected with competency-based HR analytics. Employees may feel more satisfied when evaluation criteria are transparent, development opportunities are personalized, training corresponds to actual needs, and career decisions are based on objective data. However, satisfaction may decrease if analytics is perceived as surveillance, if algorithms are opaque, or if employees have no opportunity to discuss or contest analytical conclusions. Therefore, competency-based HR analytics must be based on trust, ethical governance, and dialogue between employees, managers, and HR professionals.

The findings also show that HR professionals need analytical and competency-management capabilities. The effective use of HR analytics requires knowledge of data analysis, HR information systems, competency modelling, employee development, and ethical data governance. Without these capabilities, organizations may collect large amounts of data but fail to transform them into meaningful development decisions. Therefore, the competency-based approach should be applied not only to IT employees but also to HR departments themselves.

Table 9. Practical implementation recommendations for IT companies

Recommendation	Purpose	Expected effect
Develop role-based competency frameworks	Define current and future competency expectations	More consistent recruitment, evaluation, and development
Integrate analytics with training systems	Connect skill gaps with personalized learning paths	Higher employee satisfaction and competence development
Train HR professionals and managers	Improve data interpretation and ethical use of analytics	More meaningful and fair HR decisions
Increase transparency for employees	Explain what data are collected and how decisions are made	Higher trust and lower resistance
Maintain human oversight	Prevent overreliance on automated conclusions	Better ethical governance and employee protection
Monitor data quality	Ensure accuracy and relevance of analytical outputs	More reliable competency-based decisions

Source: developed by the authors based on Angrave et al. (2016), Rasmussen and Ulrich (2015), Minbaeva (2018), Hamilton and Sodeman (2020), and Leicht-Deobald et al. (2019).

The study has practical implications for IT companies. Organizations should develop clear competency frameworks for key roles and connect these frameworks with HR analytical tools. Dashboards, performance

systems, and workforce analytics platforms should show not only performance indicators but also competency indicators, learning needs, and development progress. Companies should also train HR professionals and line managers in competency-based analytics, strengthen transparency and employee participation, use analytics to personalize training and career development, and improve data quality and ethical governance.

Conclusions. This article reframed the impact of HR analytical tools on employee satisfaction and performance in the IT industry through a competency-based approach. The findings show that HR analytics can support employee performance not only by improving monitoring and evaluation but also by identifying skill gaps, supporting personalized training, aligning employee competencies with organizational goals, and increasing transparency in HR decisions.

The data indicate that IT organizations are already using HR analytics in areas directly connected with competency management, particularly performance management, training and development, and recruitment. A high level of awareness of HR analytics among employees creates favourable conditions for competency-based implementation. The use of performance metrics systems, dashboards, workforce analytics, and personalized learning analytics confirms that HR analytics can serve as a developmental mechanism when linked with competency frameworks.

The competency-based approach demonstrates that the true strategic value of HR analytics lies in its capacity to transform workforce data into developmental decisions. In the IT industry, where competencies quickly become outdated and employee mobility is high, organizations need systems that can continuously identify current and future competency requirements. HR analytics provides the methodological and technological basis for such systems. However, its effectiveness depends on ethical governance, data quality, analytical skills, employee trust, and integration into a broader competency management model.

The study concludes that competency-based HR analytics can improve both employee satisfaction and employee performance when it is used as a supportive and developmental mechanism. It should help employees understand expectations, receive fair feedback, access relevant training, and build career trajectories. For organizations, it can improve productivity, efficiency, accountability, and strategic workforce planning. Therefore, HR analytics should be understood not only as a digital HR tool but also as a core element of competency-based human capital development in the IT industry.

Future research should expand the sample size and include IT organizations from different regions and countries. Comparative studies across industries would also be useful for understanding whether competency-based HR analytics has different effects in IT, banking, healthcare, education, and manufacturing. Future studies should investigate

the role of artificial intelligence and machine learning in competency prediction, personalized learning, and career development. Longitudinal research would make it possible to examine how HR analytics influences employee competencies, satisfaction, and performance over time.

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