

Modeling challenges to implement HR analytics in IT sector using ISM

Aiman Zubair¹ 

Aylin Erdoğan² 

¹Miss, Istanbul Arel University, Türkiye, e-mail: aiman.zubair23@gmail.com

²Assoc. Prof. Dr., Istanbul Arel University, Faculty of Economics and Administrative Sciences, Department of Finance and Banking, Türkiye, e-mail: aylinerdogdu@arel.edu.tr

Abstract

This research paper delves into the intricate landscape of modeling challenges that hinder the integration of Human Resources (HR) analytics within the Information Technology (IT) sector. Employing a qualitative research methodology, the study conducts structured interviews to unravel the nuanced layers of impediments faced by organizations aspiring to harness the power of HR analytics. The research primarily employs Interpretive Structural Modeling (ISM) to map the interdependencies among these challenges, offering a comprehensive understanding of their hierarchical nature.

The findings of this study contribute significantly to the existing body of knowledge by identifying key challenges ranging from data privacy concerns to the integration of analytics into HR decision-making processes. By illuminating the intricacies of these challenges, the research aims to guide the creation of strategic frameworks capable of overcoming them. Ultimately, this study seeks to pave the way for the effective implementation of HR analytics in the IT sector, fostering a culture where data-driven insights drive organizational decisions and enhance workforce management. Keywords: HR Analytics, Challenges of Implementing HR analytics, HR in IT sector, ISM technique.

Keywords: Human Resources Management, Information Technology, Interpretive Structural Modeling

JEL codes: O15

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Corresponding Author/ Sorumlu Yazar:
Aiman Zubair
E-mail: aiman.zubair23@gmail.com



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1. INTRODUCTION

The pivotal role of human resources as a cornerstone for organizational competitiveness is widely acknowledged. The integration of HR analytics, coupled with its alignment with other organizational functions, holds the potential to enhance overall organizational performance by fostering increased employee productivity. The application of analytics in workforce planning offers a proactive solution to address the evolving demands of the business environment. In the contemporary landscape, HR transcends its traditional role of strategy execution to actively contributing insights for the formulation of strategic initiatives. Consequently, to establish robust HR practices that can withstand the rigors of a competitive environment, the adoption of HR analytics emerges as a guiding force and a potential savior.

Nevertheless, organizations grapple with an ongoing dilemma regarding the adoption of HR analytics technology to address pressing issues faced by HR managers, such as high turnover rates, low absenteeism, workforce forecasting, talent acquisition, and skill gaps. Extensive research underscores the pivotal role of HR analytics in capturing and analyzing data, providing meaningful information for HR managers to formulate accurate solutions to human-centric organizational challenges. Despite the transformative potential of analytics in the HR domain, its value remains undervalued and underutilized.

The efficacy of HR practices presents a formidable challenge, necessitating a meticulous evaluation of their impact on employee performance and organizational outcomes. This evaluation demands careful planning and consideration of various factors, further complicated by the intricate nature of human behavior, adding an additional layer of difficulty in deciphering the relationships between HR practices and their outcomes. Hence, a comprehensive and systematic approach is imperative for HR evaluation to ensure accurate analysis and informed decision making.

In the contemporary corporate landscape,

where information reigns supreme, and critical decisions are increasingly guided by empirical insights, Human Resources (HR) Analytics has emerged as a vital discipline. Organizations leverage data analytics to optimize workforce management, aligning talent strategies with overarching business objectives. However, this intricate interplay between human resources and data-driven strategies is not devoid of complexities and challenges.

This paper endeavors to meticulously identify barriers to the implementation of HR analytics and provides elucidations to effectively address these challenges.

2. LITERATURE REVIEW

With the progression of technologies and evolving organizational practices, there has been a discernible shift in the management of HR data (Tomar and Gaur, 2020). The heightened significance of HR analytics has captured the attention of HR practitioners, aiming to formulate enhanced HR strategies and practices (Faletta and Combs, 2021). Marler and Boudreau (2017) conducted an evidence-based review employing an integrative synthesis approach, positing that HR analytics transcends conventional HR metrics. Instead, it employs a sophisticated analytical toolset to inform HR strategy and evidence-based decision-making. HR analytics, delineated as the systematic process for collecting and analyzing data pertaining to human resources, necessitates investment in training managers proficient in HR analytics. This investment is crucial for expeditious and well-informed decision-making regarding human resources, involving the acquisition of skills in data analysis and interpretation through mathematical techniques.

Prominent organizations are engaging in a diverse array of HR research and analytics practices that surpass rudimentary metrics, scorecards, and Software as a Service (SaaS)-based human capital technology platforms (Faletta and Combs, 2021). Angrave et al. (2016) contend that HR analytics should facilitate active research and experimentation to discern the root causes of individual and organizational

performance, along with other critical outcomes.

The application of HR analytics ensures a transformative approach to enhancing employee efficiency, engagement, and overall organizational performance. By scrutinizing intricate patterns within workforce data,

companies can unveil concealed relationships, identify potential inefficiencies, and refine talent acquisition and retention strategies. This analytical capability enhances the anticipation of future workforce trends, facilitating succession planning, and enabling proactive measures to mitigate potential human resource gaps.

Table 1. Barriers in implementing HR analytics

Barrier code	Barrier Name	Explanation	References
B1	Lack of Analytic Skills in the Workforce	The workforce may try to be fair and well-intended to understand the relevance of analytical skills in recent times. The organization must assist its employees in developing and procuring skills related to HR analytics.	Kakkar and Kaushik, 2019
B2	Lack of Access to Real Time Workforce Analytics	The organization should aim at identifying the short term and long-term HR goals based on reactive and proactive goals of the business.	Kakkar and Kaushik, 2019
B3	Lack of HR Alignment with Business Strategy	HR analytics play a central role in strategy formulation and insights are used to align decision with execution.	Kakkar and Kaushik, 2019
B4	Multiple Database with Little to no Integration	The integration of different information sets from different HR frameworks, such as finance, execution assessments, and worker overviews, presents a specialized challenge. Guaranteeing consistent information harmonization whereas regarding information protection directions requires fastidious consideration of detail	Kakkar and Kaushik, 2019
B5	Little or no Integration of HR Systems with Other Enterprise Systems	The HR analytics system in many organizations is usually restricted to a handful of projects	Kakkar and Kaushik, 2019
B6	Outdated or Inadequate Analytics Tools and Technology	Errors, irregularities, or inclinations in information sources can lead to skewed experiences, eventually obstructing viable decision-making.	Kakkar and Kaushik, 2019
B7	Analytics not a Priority for the Organization	Decisions based on insightful HR analytics enable a higher predictive and fact-based workforce choice to establish a comprehensive business strategy. An ongoing and proactive HR analytics cycle can resolve most pressing organizational problems.	Kakkar and Kaushik, 2019
B8	Lack of Budget for HR Measurement	Understanding the HR priorities including the stakeholder's requirement in order to remove outdated practices and modifying new practices to provide solutions requires research and investment.	Kakkar and Kaushik, 2019
B9	Lack of Data about Individual Employee Performance	HR experts and investigators must collaborate closely to bridge this information hole and guarantee that data-driven experiences adjust with the nuanced requests of human asset administration.	
B10	Concerns with the Organization Structure	Organizations must hook with guaranteeing straightforwardness, picking up worker assent, and following information security controls, all while harvesting the benefits of strong HR Analytics hones	Kakkar and Kaushik, 2019

However, amidst these promises, HR analytics specialists face a substantial set of challenges.

Study attempts to develop TISM of ten barriers identified from the literature in implementing HR analytics. The relevant literature in the context is provided in subsequent table:

3. THE STUDY

In order to achieve the objectives of this study, ISM (interpretive structural modeling), which has been used. This research utilizes Interpretive Structural Modeling (ISM) to identify and analyze the complex relationships between various factors promoting sustainable agriculture practices. As noted by Warfield (1974) and Sushil (2012), ISM helps elucidate the “what,” “why,” and “how” of such associations. Building on existing literature and expert opinion, a novel conceptual model is developed following the established ISM framework (Rajan, Dhir, & Sushil, 2020a).

3.1. Steps of ISM Analysis:

Step 1- Identification and Definition of Factors: A comprehensive review of relevant literature is conducted to identify and define key factors that influence the growth of sustainable agriculture practices.

Step 2- Defining Contextual Relationships between the factors: Contextual relationships are established between identified factors using statements like “Factor A influences/enhances Factor B.”

Step 3- Interpretation of Relationships identified in the preceding steps: In-depth analysis of the established relationships, coupled with further literature review, helps refine and strengthen the understanding of the complex interactions between factors.

Step 4- Pairwise Comparisons: To construct a “knowledge-base,” all factors are compared pairwise. The presence of a relationship is denoted by “Yes (Y),” while its absence is marked as “No (N).”

Step 5- Reachability Matrix: The “Y” and “N” values from the previous step are transformed

into “1” and “0” respectively, forming the initial reachability matrix.

Step 6- Partitioning into Hierarchical Levels: Following the traditional ISM approach, factors are partitioned into hierarchical levels based on their driving and dependence powers. This process is iterated until all factors are assigned their respective levels.

Step 7- Digraph Representation: A digraph is constructed to visualize the relationships between factors. Direct links are represented by arrows, while factors are positioned according to their hierarchical levels.

Step 8- Interpretive Structural Model: The final ISM model is developed by integrating the digraph with the final reachability matrix, providing a comprehensive understanding of the interconnectedness and influence between the identified factors.

3.2. Population and Sample Size

The population of this study consists of HR working individuals ranging from ages 23-30 having some experience in the HR field. The sample of this study comprises 15 participants male and female.

The sample size was chosen to be 15 participants based on considerations which include time resource limitation.

Table 2. Participants Demographics

Gender	Frequency	Percentage
Male	7	53.3%
Female	8	46.7%

3.3. Data Collection Instrument

For this study, questionnaire and semi-structured interviews with HR professionals who had prior experience implementing HR analytics, data was gathered using an ISM template. The methodology adopted will develop a hierarchical model depicting challenges faced by HR practitioners. Quantitative questions were also included in the interviews to get some in depth and precise information. However, the most part of the study was qualitative.

3.4. Originality

This study’s originality lies in its application of Interpretive Structural Modeling (ISM) to develop a novel and comprehensive framework elucidating the complex interplay between various factors influencing the implementation of HR analytics, specifically focusing on the challenges faced by HR practitioners in the Indian context. This research offers unique empirical evidence, illuminating the intricate relationships and dynamics within the HR analytics implementation landscape in India. By critically analyzing the identified barriers, this study paves the way for the development of more effective strategies to overcome them, ultimately rendering HR analytics a readily usable tool within organizations. Through effective management of these barriers, organizations can unlock the full potential of HR analytics and harness its power to drive informed decision-making and elevate talent management practices.

3.5. Limitations

Due to limited time and resources this study has some limitations such as small sample size, limited geographical scope which constricts the generalizability of the research. The qualitative nature of this research inherently invites researcher bias and subjectivity into the process.

4. FINDINGS

This paper presents a comprehensive conceptual review of HR analytics, followed by the application of Interpretive Structural Modeling (ISM), a qualitative method, to develop a hierarchical model that visualizes the interconnectedness and relative importance of various challenges hindering HR analytics implementation. The resulting model offers valuable insights to HR practitioners by illuminating the complex relationships and dynamics within the HR analytics landscape. These insights can inform the development of more effective strategies to overcome these challenges and ultimately unlock the full potential of HR analytics within organizations.

Initial reachability matrix was made after collecting the responses from HR professionals.

Table 3. The Initial Reachability Matrix

Element	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
B1	Y	Y	Y	Y	Y	Y	Y	N	N	N
B2	N	Y	Y	N	Y	N	N	N	Y	N
B3	Y	Y	Y	Y	Y	Y	N	Y	Y	N
B4	N	N	Y	Y	Y	N	N	N	Y	Y
B5	Y	Y	Y	N	Y	Y	N	Y	Y	N
B6	Y	Y	N	Y	Y	Y	N	N	Y	N
B7	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
B8	Y	Y	Y	N	Y	Y	N	Y	Y	N
B9	N	Y	Y	N	N	N	N	N	Y	Y
B10	N	N	N	Y	N	Y	N	Y	Y	Y

After developing initial reachability matrix, final reachability matrix was formed.

Table 4. Final Reachability Matrix

Element	1	2	3	4	5	6	7	8	9	10	Driving power	Rank as per driving power
1	1	1	1	1	1	1	1	0	0	0	7	3
2	0	1	1	0	1	0	0	0	1	0	4	6
3	1	1	1	1	1	1	0	1	1	0	8	2
4	0	0	1	1	1	0	0	0	1	1	5	5
5	1	1	0	0	1	1	0	1	1	0	6	4
6	1	1	1	1	1	1	0	0	1	0	7	2
7	1	1	1	1	1	1	1	1	1	0	9	1
8	1	1	1	0	1	1	0	1	1	0	7	3
9	0	1	1	0	0	0	0	0	1	1	4	6
10	0	0	0	1	0	1	0	1	1	1	5	5
Dependence	6	8	8	6	8	7	2	5	9	3		
Rank as per dependence	4	2	2	4	2	3	6	5	1			

Table 5. Partitioning Of Hierarchical Levels

Elements	R. set	A. set	Int. set	Level
(A): Iteration				
B1	1,2,3,4,5,6,7	1,3,5,6,7,8	1,3,5,6,7	
B2	2,3,5,9	1,2,3,5,6,7,8,9	2,3,5,9	I
B3	1,2,3,4,5,6,8,9	1,2,3,4,5,7,8	1,2,3,4,5,8,9	
B4	3,4,5,9,10	1,3,4,6,7,10	3,4,10	
B5	1,2,3,5,6,8,9	1,2,3,4,5,6,7,8	1,3,5,8,6	
B6	1,2,4,5,6,9	1,3,5,6,7,8,10	1,6,5	
B7	1,2,3,4,5,6,7,8,9	1,7	1,7	
B8	1,2,3,5,6,8,9	3,5,7,8,10	3,5,8	
B9	2,3,9,10	2,3,4,5,6,7,8,9,10	2,3,9,10	I
B10	6,5,9,10,4	4,9,10	4,9,10	
(B): Iteration 2				
B1	1,3,4,5,6,7	1,3,5,6,7,8	1,3,5,6,7	
B3	1,3,4,5,6,8	1,3,4,5,7,8	1,3,4,5,8	
B4	3,4,5,10	1,3,4,6,7,10	3,4,10	
B5	1,3,5,6,8	1,3,4,5,6,7,8	1,3,5,6,8	II
B6	1,4,5,6	1,3,5,6,7,8,10	1,5,6	
B7	1,3,4,5,6,7,8	1,7	1,7	
B8	1,3,5,6,8	3,5,7,8,10	3,5,8	
B10	6,5,10,4	4,10	4,10	
(C) : Iteration 3				
B1	1,3,4,6,7	1,3,6,7,8	1,3,6,7	
B3	1,3,4,6,8	1,3,4,7,8	1,3,4,8	
B4	3,4,10	1,3,4,6,7,10	3,4,10	III
B6	1,4,6	1,3,6,7,8,10	3,4,10	
B7	1,3,4,6,7,8	1,7	1,7	
B8	1,3,6,8	3,7,8,10	3,8	
B10	6,10,4	4,10	6,10	
(D) : Iteration 4				
B1	1,3,6,7	1,3,6,7,8	1,3,6,7	IV
B3	1,3,6,8	1,3,7,8	1,3,8	
B6	1,6	1,3,6	1,3,6,7,8,10	
B7	1,3,6,7,8	1,7	1,7	
B8	1,3,6,8	3,7,8,10	3,8	
B10	6,10	10	10	
(E) : Iteration 5				
B3	3,8	3,7,8	3,8	V
B7	3,7,8	7	7	
B8	3,8	3,7,8,10	3,8	
B10	10	10	10	V
(F) : Iteration6				
B7	7	7	7	IV

*R. set: Reachability set *A. set : Antecedent set *I. set : Intersection set

Table 6. Hierarchical Levels

S.no	Barrier code	Barrier Name	Level in ISM
1	B2	Lack of Access to Real Time Workforce Analytics	I
2	B9	Lack of data about Individual Employee Performance	I
3	B5	Little to no Integration of HR systems to other Systems	II
4	B4	Multiple databases with Little to no Integration	III
5	B1	Lack of Analytic Skills in the Workforce	IV
6	B6	Outdated or Inadequate Analytic Tools and technology	IV
7	B3	Lack of HR alignment with Business Strategy	V
8	B8	Lack of Budget for HR Measurement	V
9	B10	Concerns with the Organization Structure	V
10	B7	Budget not a Priority for the Organization	VI

According to Srivastava and Sushil (2013), the final reachability matrix is then used to form reachability set and antecedent set.

The next step is to develop the level partitioning using the final reachability matrix. The intersection set consists of the common elements from both the sets. Variables which have common elements in the intersection as well as antecedent set are placed at the first level and are removed from the iteration. Then the next level is found out the same way and the researcher keeps repeating the process till group levels are allotted to all the variables. The partitioning of variables into different levels helps in deciding the hierarchy of the diagraph.

The various hierarchical levels according to which the diagraph and ISM model is to be constructed are as follows

The diagraph is constructed on the basis of the hierarchical levels partitioned in the above table. It shows the relationships between the various factors.

5. DISCUSSION AND CONCLUSION

Path B7-B3-B1-B4-B5-B2

The corporation should prioritize analytics because a lack of them may make it harder to integrate HR with business strategy. Ensuring that data is accurately transformed into relevant information is crucial for making data-driven decisions and optimizing the capabilities of their workforce. Managers and HR specialists benefit greatly from analytical skills since they enable them to collect, analyze, and make sense of pertinent personnel data in order to make well informed decisions. If this isn't done, it can affect how other databases are integrated into the HR system. In the absence of these functionalities, hiring, performance reviews, promotions, and other critical workforce management choices could be based on arbitrary or insufficient data by HR specialists and managers. These individuals can evaluate data, spot trends and patterns, create scenarios, and forecast future results thanks to their analytical skills. Better workforce planning, more efficient decision-making and greater talent alignment with corporate goals

can all result from this.

Path B10-B8-B6-B4-B5-B9

Businesses with complex or troublesome organizational structures will allocate insufficient funds for HR functions, which will undoubtedly result in lower investments in tools and technology and challenges that could occur when integrating HR analytics with other organizational tasks. The company's study of its human resources data will lead to greater business outcomes and decision-making. Improper utilization of personal performance information might provide challenges to improving decision-making regarding individuals.

6. MANAGERIAL IMPLICATIONS

Data analysis is introduced in order for the HR department to take action in order to address these issues. The aforementioned obstacles may make it challenging to analyze HR data and get useful information from it. Supervisors have to make sure staff members have the knowledge and resources necessary to analyze data and come to wise judgments. An organization with good organizational structure can apply HR analytics in a methodical and deliberate way. Adequate investment in technology is necessary to guarantee that the data is dependable, easily available, and prepared for analysis and decision making. Organizations can increase efficiency and effectiveness by better understanding their operations, spotting trends, and making well informed decisions through data collection and organizing.

7. CONCLUSIONS

But there's still another leap: deciphering the complex analytics yield. While knowledge based on data can be immensely valuable, understanding intricate quantifiable models and translating them into meaningful HR practices calls for a unique skill set. Moral reflections also endure a great deal. A growing moral dilemma is posed by the delicate balance between protecting individual protection and providing representative data for better decision-making. Employing HR analytics that are easily understood by all is necessary for a firm. This

entails speaking simply and clearly, staying away from jargon and technical phrases, and, when needed, providing illustrations or graphs. HR specialists should also be able to communicate the data and its significance to others so that everyone is aware of the ramifications and is able to make decisions based on the information supplied.

The various obstacles that firms confront in the field of HR Analytics have been extensively researched for this article. Investigating these issues becomes important as companies try to harness data's potential for improving human resource systems. Organizations can get over these obstacles with creative thinking and a sophisticated grasp of information analytics, opening the door to a wasted moment of efficient personnel management and cost-effective organizational growth.

REFERENCES

- ANGRAVE, D., CHARLWOOD, A., KIRKPATRICK, I., LAWRENCE, M. AND STUART, M. (2016), HR and analytics: why HR is set to fail the big data challenge, *Human Resource Management Journal*, Vol. 26, pp. 1-11.
- FALLETTA, S. V., & COMBS, W. L. (2021). The HR analytics cycle: a seven-step process for building evidence-based and ethical HR analytics capabilities. *Journal of Work-Applied Management*, 13(1), 51-68.
- KAKKAR, H & KAUSHIK, S, (2019), Barriers in Implementing HR Analytics – A Study of IT/ ITES Companies in India, *International Journal of Economic Research*, Vol 16, No. 1
- MARLER, J.H. & BOUDREAU, J.W., (2017), An evidence-based review of HR analytics, *The International Journal of Human Resource Management*, 28(1) 3-26.
- TOMAR, S., & GAUR, M. (2020). HR analytics in Business: Role, Opportunities, and Challenges of Using It. *Journal of Xi'an University of Architecture & Technology*, 12(7), 1299-1306.

APPENDICES

S. no.	Variable code	Variable	Description
1	V1	Lack of data integration and sharing	The lack of data integration and sharing can significantly hinder the effectiveness of data analytics, leading to suboptimal decision-making, increased costs, and security risks. Companies must prioritize data integration and sharing to reap the full benefits of data analytics and make informed decisions.
2	V2	Insufficient data and metrics	insufficient data and metrics can limit the effectiveness of data analysis and lead to incomplete or inaccurate conclusions. Companies must prioritize data collection and metrics development to make informed decisions, measure progress, and achieve their business goals.
3	V3	Low quality if HR data	The absence of consistent and standardized measures poses a significant challenge in the comparison and analysis of data across different entities, thereby impairing the capacity to extract valuable insights. Notably, endeavors are being undertaken to establish norms in this domain.
4	V4	Lack of strategic HR focus in complex models	The lack of a strategic HR focus in complex models can undermine the effectiveness of HR analytics. While complex models can offer advanced statistical techniques, their value diminishes if they fail to align with strategic HR objectives. It is crucial to ensure that HR analytics efforts are driven by a clear understanding of organizational goals and are designed to address specific HR challenges. By incorporating strategic HR considerations into complex models, organizations can derive actionable insights that support decision-making and drive meaningful HR outcomes.
5	V5	Lack of knowledge, skills, and competencies related to analytics	The absence of consistent and standardized measures poses a significant challenge in the comparison and analysis of data across different entities, thereby impairing the capacity to extract valuable insights. Notably, endeavors are being undertaken to establish norms in this domain.
6	V6	Lack of strategic business view	The lack of a strategic business view hampers the effectiveness of HR analytics. Understanding the organizational context and aligning analytics with business goals is crucial. HR teams should develop a strategic mindset, collaborate with other functions, and involve key stakeholders to overcome this challenge and drive meaningful insights.
7	V7	Lack of storytelling skills	The absence of consistent and standardized measures poses a significant challenge in the comparison and analysis of data across different entities, thereby impairing the capacity to extract valuable insights. It is noteworthy that endeavors are being undertaken to establish norms in this domain.
8	V8	Replace the management discussion by HR Analytics	By utilizing HR analytics, organizations can leverage data to gain insights into employee performance, workforce trends, and talent management. This enables HR professionals to provide evidence-based recommendations, identify areas for improvement, and align HR strategies with organizational goals. HR analytics empowers HR departments to contribute strategically to the overall success of the business by optimizing HR processes, enhancing employee engagement, and driving better outcomes.
9	V9	Incompatibilities between systems to merge data from different units	Contradictions between frameworks can prevent combining information from diverse units in HR analytics. Contrasts in information groups, structures, and naming traditions posture challenges. Techniques to address this incorporate information standardization, information change, utilization of integration platforms/tools, and investigating API integration choices.

V1- Lack of data integration and sharing

S. no	Element	Comparison	Y\N
1	V1-V2	Lack of data integration and sharing will influence or enhance Insufficient data and metrics	
2	V2-V1	Insufficient data and metrics will influence or enhance Lack of data integration and sharing	
3	V1-V3	Lack of data integration and sharing will influence or enhance low quality of HR data	
4	V3-V1	Low quality of HR data will influence or enhance Lack of data integration and sharing	
5	V1-V4	Lack of data integration will influence or enhance lack of strategic HR focus in complex models	
6	V4-V1	Low quality of HR data will influence or enhance Lack of data integration	
7	V1-V5	Lack of data integration will influence or enhance the Lack of knowledge, skills, and competencies related to analytics	
8	V5-V1	Lack of knowledge, skills, and competencies related to analytics will influence or enhance the Lack of data integration	
9	V1-V6	Lack of data integration will influence or enhance Lack of strategic business view	
10	V6-V1	The lack of a strategic business view will influence or enhance the Lack of data integration	
11	V1-V7	Lack of data integration will influence or enhance the Lack of storytelling skills	
12	V7-V1	Lack of storytelling skills will influence or enhance the Lack of data integration	
13	V1-V8	Lack of data integration will influence or enhance replace the management discussion by HR Analytics	
14	V8-V1	Lack of data integration will influence or enhance replace the management discussion by HR Analytics	
15	V1-V9	Lack of data integration will influence or enhance Incompatibilities between systems to merge data from different units.	
16	V9-V1	Incompatibilities between systems to merge data from different units will influence or enhance the Lack of data integration.	

V2- Insufficient data and metrics

17	V2-V3	Insufficient data and metrics will influence or enhance the low quality of HR data	
18	V3-V2	The low quality of HR data will influence or enhance Insufficient data and metrics	
19	V2-V4	Lack of strategic HR focus in complex models will influence or enhance Insufficient data and metrics	
20	V4-V2	Insufficient data and metrics will influence or enhance the Lack of strategic HR focus in complex models	
21	V2-V5	The lack of knowledge, skills, and competencies related to analytics will influence or enhance Insufficient data and metrics.	
22	V5-V2	Insufficient data and metrics will influence or enhance the lack of knowledge, skills, and competencies related to analytics	
23	V2-V6	Insufficient data and metrics will influence or enhance the Lack of a strategic business view	
24	V6-V2	The Lack of a strategic business view will influence or enhance	
25	V2-V7	Insufficient data and metrics will influence or enhance the Lack of storytelling skills	
26	V7-V2	Lack of storytelling skills will influence or enhance the Insufficient data and metric	
27	V2-V8	Insufficient data and metrics will influence or enhance Replace the management discussion with HR Analytic	
28	V8-V2	Replace the management discussion with HR Analytic will influence or enhance Insufficient data and metrics	

29	V2-V9	Replace the management discussion with HR Analytic will influence or enhance Insufficient data and metrics	
30	V9-V2	Incompatibilities between systems to merge data from different units will influence or enhance Insufficient data and metric	

V3-Low quality of HR data

31	V3-V4	Low quality of HR data will influence or enhance Lack of strategic HR focus in complex models	
32	V4-V3	Lack of strategic HR focus in complex models will influence or enhance Low quality of HR data	
33	V3-V5	Low quality of HR data will influence or enhance Lack of knowledge, skills, and competencies related to analytics	
34	V5-V3	Lack of knowledge, skills, and competencies related to analytics will influence Low quality of HR data	
35	V3-V6	Low quality of HR data will influence or enhance the lack of strategic business view	
36	V6-V3	lack of strategic business view will influence or enhance Low quality of HR data	
37	V3-V7	Low quality of HR data will influence or enhance lack of storytelling skills	
38	V7-V3	Lack of storytelling skills will influence or enhance Low quality of HR data	
39	V3-V8	Low quality of HR data will influence or enhance Replace the management discussion by HR Analytics	
40	V8-V3	Replace the management discussion by HR Analytics will influence or enhance Low quality of HR data	
41	V3-V9	Low quality of HR data will influence or enhance Incompatibilities between systems to merge data from different units	
42	V9-V3	Incompatibilities between systems to merge data from different units will influence or enhance Low quality of HR data	

V4- Low quality of HR data

43	V4-V5	Lack of strategic HR focus in complex models will influence or enhance the lack of knowledge, skills, and competencies related to analytics	
44	V5-V4	lack of knowledge, skills, and competencies related to analytics will influence or enhance Lack of strategic HR focus in complex models	
45	V4-V6	Lack of strategic HR focus in complex models will influence or enhance the Lack of strategic business view	
46	V6-V4	Lack of strategic business view will influence or enhance Lack of strategic HR focus in complex models	
46	V4-V7	Lack of strategic HR focus in complex models will influence or enhance Lack of storytelling skills	
48	V7-V4	Lack of storytelling skills will influence or enhance Lack of strategic HR focus in complex models	
49	V4-V8	Lack of strategic HR focus in complex models will influence or enhance Replace the management discussion by HR Analytics	
50	V8-V4	Replace the management discussion by HR Analytics will influence or enhance Lack of strategic HR focus in complex models	
51	V4-V9	Lack of strategic HR focus in complex models will influence or enhance Incompatibilities between systems to merge data from different units	
52	V9-V4	Lack of strategic HR focus in complex models will influence or enhance Incompatibilities between systems to merge data from	

V5-Lack of knowledge, skills, and competencies related to analytics

53	V5-V6	Lack of knowledge, skills, and competencies related to analytics will influence or enhance Lack of strategic business view	
54	V6-V5	Lack of strategic business view will influence or enhance Lack of knowledge, skills, and competencies related to analytics	

55	V5-V7	Lack of knowledge, skills, and competencies related to analytics will influence or enhance Lack of storytelling skills	
56	V7-V5	Lack of storytelling skills will influence or enhance Lack of knowledge, skills, and competencies related to analytics	
57	V5-V8	Lack of knowledge, skills, and competencies related to analytics will influence or enhance Replace the management discussion by HR Analytics	
58	V8-V5	Replace the management discussion by HR Analytics will influence or enhance Lack of knowledge, skills, and competencies related to analytics	
59	V5-V9	Lack of strategic HR focus in complex models will influence or enhance Incompatibilities between systems to merge data from different units	
60	V9-V5	Lack of strategic HR focus in complex models will influence or enhance Incompatibilities	

V6- Lack of strategic business view

61	V6-V7	Lack of strategic business view will influence or enhance Lack of storytelling skills	
62	V7-V6	Lack of storytelling skills will influence or enhance Lack of strategic business view	
63	V6-V8	Lack of strategic business view related to analytics will influence or enhance Replace the management discussion by HR Analytics	
64	V8-V6	Replace the management discussion by HR Analytics will influence or enhance Lack of strategic business view	
65	V6-V9	Lack of strategic business view to analytics will influence or enhance Incompatibilities between systems to merge data from different units	
66	V9-V6	Incompatibilities between systems to merge data from different units will influence or enhance Lack of strategic business view	

V7 Lack of storytelling skills

67	V7-V8	Lack of storytelling skills or enhance Replace the management discussion by HR Analytics	
68	V8-V7	Replace the management discussion by HR Analytics will influence or enhance Lack of storytelling skills	
69	V7-V9	Lack of storytelling skills will influence or enhance Incompatibilities between systems to merge data from different units	
70	V9-V7	Incompatibilities between systems to merge data from different units will influence or enhance Lack of storytelling skillset's view	

V8-Replace the management discussion by HR Analytics

71	V8-V9	Replace the management discussion by HR Analytics will influence or enhance Incompatibilities between systems to merge data from different units	
72	V9-V8	Incompatibilities between systems to merge data from different units influence or enhance Replace the management discussion by HR Analytics	