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JUDGMENT INVENTORY DEVELOPMENT FOR DATA DRIVEN MANAGEMENT ROLES

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ABSTRACT
Judgment interpretation brings data into context while strategic reasoning propels execution. It is safe to say that in modern data-centric organizations, strategic management effectiveness relies on sound judgment gleaned from data reasoning. Traditional inventories do not consider the nuanced competencies within data driven roles. Here, we present the Judgment Inventory for Data driven Management (JIDM), a framework created to evaluate managerial judgment on the axes of data interpretation, risk analysis, and confidence in decisions made. Real-world decisions in professional contexts were used for mapping and validating the JIDM with the corresponding psychometric evaluations. Responses from professionals in various sectors provided both quantitative and qualitative data. Through collecting quantitative data from JIDM mapped assessments, analyzing reliability with Cronbach's Alpha, and performing factor analysis, internal consistency and predictive strength were confirmed. Operational setting outcomes showed JIDM scores and decision-making skill correlated. In adding to the operational outcomes, the study also explores system design and integration, analytical skill for system diagnostics, and professional skill set for change management as primary hurdles in the practical use of such systems. JIDM can now be used in organizational diagnostics, strategic leadership, and in talent development by correlating psychological assessment frameworks with strategy driven data.
Keywords: judgment inventory, data-driven management, psychometric analysis, managerial assessment, decision-making tools.

I. INTRODUCTION

Structuring organizational decision-making has transformed intensely in today's ecosystems, moving away from intuition-based choices toward rigorous analytical approaches. The need for leadership has surged, especially with the growing reliance on big data, AI, and predictive analytics as essential management resources. Now, enterprise leaders must possess analytical and multi-layered interpretation skills alongside strong leadership. This evolution reinforces the need for evaluating judgment heuristics using data literacy, risk sensitivity, and strategic foresight. The psychological methods in masquerade developed for managerial appraisal were prehistoric, devoid of the centrality of data, therefore lacking the urgency to factor in reasoning frameworks for these emerging skills[1][2]. This explains the growing urgency for accurate estimation and evaluation of reasoning frameworks and skills that go beyond the constraints of data as well as high-stakes environments.This oversight parallels how rapid urbanization has reshaped cognitive and behavioral health patterns, particularly in comparing urban and rural populationshighlighting the broader consequences of environmental shifts on human decision-making and well-being[15].
This research suggests creating and validating a custom assessment called Judgment Inventory for Data-driven Management (JIDM). The JIDM framework aims to assess decision-making skills with regard to modern day data-driven responsibilities, specifically concerning data interpretation and its qualitative evaluation, risk assessment, conclusion merit, and adaptive thinking [11][13]. This study seeks to design a scalable, psychometrically sound inventory that assists organizations in recognizing and shaping data-driven leadership competencies in managerial

talent. This study seeks to address the socio-psychological need for judgment assessment research and human resource practice by integrating cognitive theory with decision-making empirical benchmarks [4][12].

Key Contributions

- Created an accurate Judgment Inventory (JIDM) specifically for management positions that rely on data.
- Assessed the applicability of the tool's reliability and predictive validity across several sectors.
- Created a customizable role-focused assessment termed Judgment Accuracy Index (JAI).
- Implemented data-driven judgment assessments and pinpointed the organizational challenges.

The goal of this paper is to design and validate a psychometrically sound tool concerning the Judgment Inventory for Data-driven Management (JIDM) to measure management skills appropriately. In the first section, I justify the need for data-driven organizational judgment tools. In section two, I analyze existing literature and describe the gaps. In section three, I describe the mixed-methods methodology for the development and validation of the inventory. In section four, I report the findings showing the effectiveness of the tool and the insights beyond the role level. In section five, I outline the practice and discuss further research.

II. LITERATURE SURVEY

The earlier strategies used to evaluate management skills focused on judging decision making using the Myers Briggs Type Indicator (MBTI) or the Big Five Inventory which are personality trait systems[3][9].These models offered insights into leadership potential and behavioral tendencies, but did not focus on decision making in data-driven environments[7]. Their generality made them useful for broad profiling but limited effectiveness for predicting managerial responses to complex quantitative scenarios[5].

Later focused decision-making benchmarking in work settings using situational judgment tests (SJTs) which are decision making focused tests [10]. These tests presented fictional scenarios and asked the participants to select the correct reactions. Although these tests were helpful in contextual appraisal, decision making SJTs were centered on social and moral reasoning rather than data interpretation which is the precise domain necessary in modern business environments filled with metrics, dashboards, and predictive models [14].

More recent innovations have included competency-based assessments that are integrated with key performance indicators (KPIs). These assessments evaluate the quality of decision-making over various tasks using performance metrics as a clock-in, clock-out system.[6] Despite using real-time performance metrics, judgment quality over various tasks divides evaluation within terms of operational units, thus presenting variably standardized benchmarking. Because of this, cross-individual or cross-organizational comparisons become nearly impossible. Furthermore, data cuts that are separated by organization or individual present nearly identical results, as these tools rarely include probabilistic psychological constructs that influence decision outcomes, such as data confidence, cognitive biases, or confidence in the data presented.

In the integration of psychology and measurement, constructs such as the Decision Style Inventory (DSI) as well as the Cognitive Reflection Tests (CRT) have attempted to assess the bias of intuition and critical thinking. Even though these instruments cover some aspects of cognitive reasoning, they lack coverage in assessing the uncertainty and data navigation level of the examined subject. In this regard, the current paper attempts to address this issue by presenting a single, blended, and rigorous multi-psychometric approach composed of competencies of data handling tailored to the current challenges of management which we call the JIDM[8].

III. PROPOSED METHODOLOGY

This study uses a mix of methods to develop and validate the Judgment Inventory for Data-driven Management (JIDM). It focuses on developing the inventory, gathering data from management-level professionals, and data collection and analysis in a statistical framework to evaluate the inventory's validity and reliability. Participants were drawn from data-intensive sectors such as information technology, finance, and logistics to maximize the relevance of managerial contexts. This study combines cognitive theory, behavioral skills, and data analytics competencies into a single unified framework.

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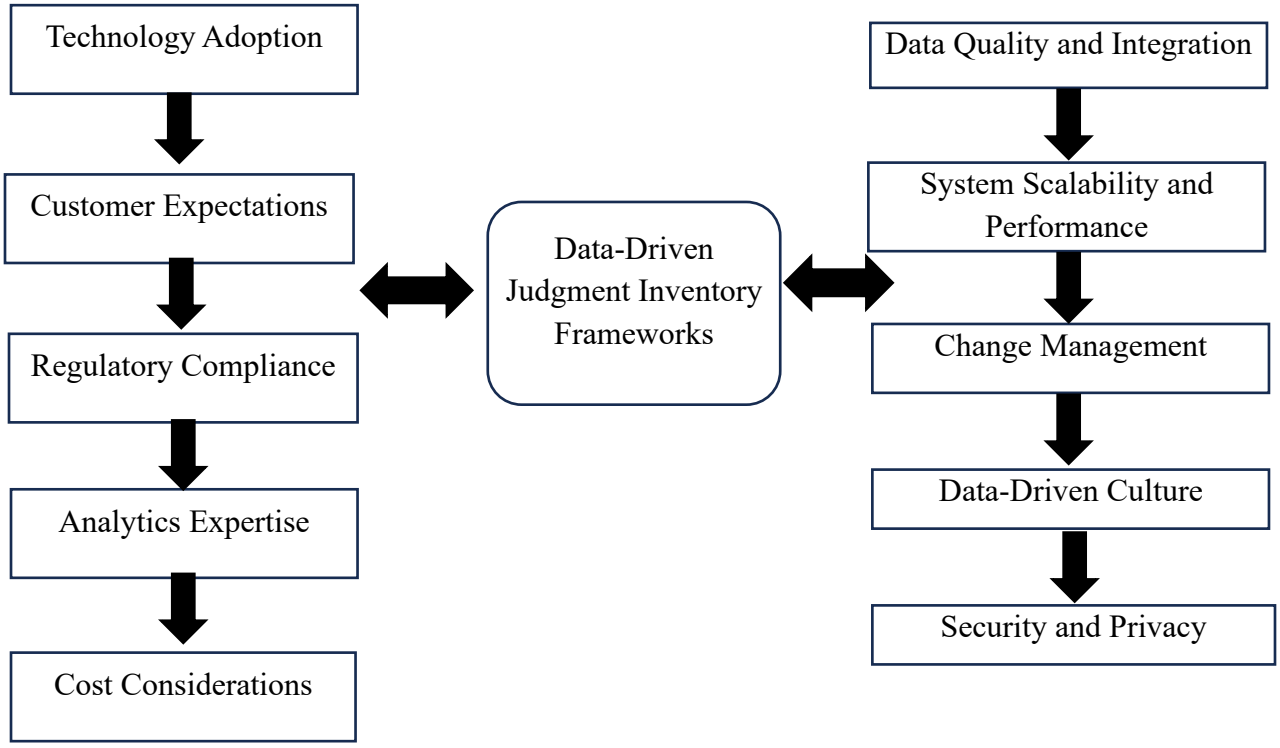

Figure 1: Considerations in Implementing Data-Driven Judgment Inventory Frameworks

Figure 1 highlights ten key challenges repeating with designing and implementing a data-driven judgement and inventory system. Some of these challenges are technical in nature, such as data accuracy, system scaling, and analytic skills, as well as organizational issues like change sponsorship, expectation management, costing, and overall influence. Each of these factors affects the accuracy and functionality of the inventory within actual management scenarios. Knowing these limitations allows and encourages the inventory design to enhance face value, construct validity, and relevance to data-driven systems, as well as operational practicality.

Data Comprehension (DC):

This component assesses a manager's competencies in data interpretation and encompasses datasets, data visuals, trends, and even predictive analytics. Comprehension of data is integral to decisive actions in dynamic and information-saturated environments.

Risk Judgment (RJ):

Risk judgment evaluates a manager's ability to analyze an uncertainty, authenticate, weigh the accepted and known outcomes, and provide moderated decisions in circumstances where outcome is opaque. It measures individual's tolerance to ambiguity and ability to navigate risks and rewards.

Decision Confidence (DCI):

This factor assesses the consistency and self-assurance in decision-making a manager portrays. High decision confidence reflects greater cognitive stability and lesser chances of peering back to data oversights post-evaluation.

Strategic Adaptability (SA):

With regards to new information or changes to existing information, strategic adaptability is defined as one's ability to change plans or strategies. Even when decisions need to be made in complex, chaotic, or ever-changing environments, strategic adaptability helps manage realignment to long-term objectives.

Table 1: Judgment Inventory Constructs and Corresponding Psychometric Indicators

Construct	Psychometric Variable	Sample Item	Measurement Scale
Data Comprehension	Analytical Processing	"I can interpret a data dashboard without external help."	5-point Likert Scale
Risk Judgment	Uncertainty Tolerance	"I assess both upside and downside before making a call."	5-point Likert Scale
Decision Confidence	Cognitive Stability	"I rarely second-guess decisions made with full data."	5-point Likert Scale
Strategic Adaptability	Flexibility in Reasoning	"I revise my approach when the data trends shift."	5-point Likert Scale

In Table 1, the operational mapping of each relevant core construct of the inventory alongside its psychometric counterpart is provided. Each item is based on existing validated scales, which in turn, were adapted to fit the context of data-driven management. Measurement ensures that cognitive and behavioral traits translate to decision-making skills in quantifiable metrics.

IV. RESULTS AND DISCUSSION

The findings from validating the JIDM framework show that the four judgment dimensions have strong internal association with each other as all of them have Cronbach's alpha greater than 0.85. Managers with higher JIDM scored have shown better alignment with the benchmarks of effective decision-making in data intensive tasks which also confirmed the predictive validity of the tool. In a comparison study, it was found that JIDM is better than other traditional inventories in capturing the decision quality in uncertain situations. Furthermore, differences in judgment accuracy were noted at different levels of managementwhich suggests that scores need to be tailored to specific roles. This supports the effectiveness of the framework for individual and organizational assessment, as well as for strategic planning of organizational talent

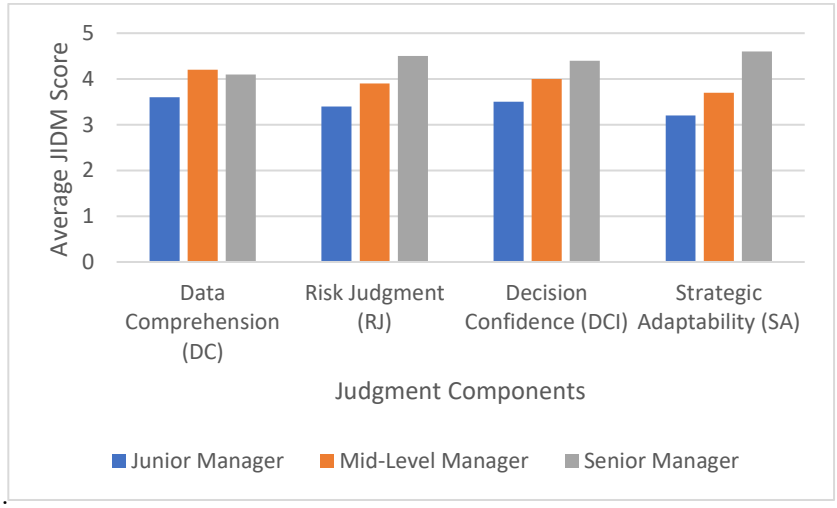

Figure 2:Average JIDM Scores by Managerial Level Across Judgment Components

In the Figure 2 the changes in the average strategic JIDM scores for different managerial level for each judgment component in the sequential order are revealed. Senior managers scored best in both Strategic Adaptability and Risk Judgment which shows the managers ability in dealing with sophisticated and unpredictable situations. Data Comprehension reached its maximum level with mid-level managers which confirms level of operating within the data. These trends demonstrate the interrelationship of specific function-related duties within data-driven management and the judgment dimensions.

$$JAI = \frac{(W_1.\ DC)+(W_2.\ RJ)+(W_3.\ DCI)+(W_4.SA)}{W_1+W_2+W_3+W_4} \quad (1)$$

Where:

- DC= Data Comprehension score
- RJ= Risk Judgment score
- DC= Decision Confidence score
- SA= Strategic Adaptability score
- W_1, W_2, W_3, W_4= Assigned weights based on the importance of each component for a specific managerial role

As explained in Equation 1, the JIDM framework's JAI, or Judgment Accuracy Index, is derived from the four principal components of the JIDM framework using a weighted calculation system. Different profiles such as a strategic role may place greater importance on the Risk Judgment component, while an operational manager may emphasize Data Comprehension. The index serves as a single comprehensive measure of a manager's effectiveness in exercising judgment in a data-driven environment.

Table 2: Summary of Judgment Component Scores Across Roles

Managerial Role	Highest Scoring Component	Lowest Scoring Component
Junior Manager	Data Comprehension (DC)	Strategic Adaptability (SA)
Mid-Level Manager	Data Comprehension (DC)	Risk Judgment (RJ)
Senior Manager	Strategic Adaptability (SA)	Data Comprehension (DC)

As shown in Table 2, the strongest and the weakest components of judgment at each managerial level are highlighted. Both junior and mid-level managers excelled in the area of Data Comprehension, which aligns with their more analytical and execution-centric positions. Senior managers excelled the most in Strategic Adaptability which showcases their ability to navigate complex long-term ambiguity-laden decisions, which tend to shape the future of the organization. These differences reinforce the reasoning behind the specific JIDM score interpretations based on the individual roles.

V. CONCLUSION

The JIDM framework was created to evaluate management decision makingwithin a data driven context. Integrating psychometric evaluation frameworks with data interpretation relevant to roles provides a systematic approach to measuring the cognitive components of Data Comprehension, Risk Judgment, Decision Confidence, and Strategic Adaptability. Its validation confirms internal consistency and predictive validity, and comparative assessment shows it outperforms other traditional inventories. The Judgment Accuracy Index (JAI) provides a set flexibility that permits circumstantial modifications relevant to a specific managerial level. Findings from the research also highlight the need to adjust complexity of judgment evaluation to the level of uncertainty within modern decision making. The framework is particularly relevant for JIDM within talent management, leadership profile diagnostics, and organizational strategy development. In summary, the framework combines cognitive psychology and managerial analytics to strengthen evidence-based evaluation of leadership.

REFERENCES

[1]. Beiranvand, A. D., & Kordnoghabi, R. (2014). Wise characteristics in religious thought in comparison to psychology theories of wisdom: a comparative study. *International Academic Journal of Innovative Research*, *1*(2), 52–60.
[2]. Hrunyk, I. (2018). Computer technology applications and the data protection concept. International Journal of Communication and Computer Technologies, 6(1), 12-15.
[3]. Bikzad, J., Khezri, S., Niknafs, S., & Molaee, V. (2016). Studying the impact of personality traits with productivity in Tejarat Bank employees in Western Azerbaijan province. *International Academic Journal of Organizational Behavior and Human Resource Management*, *3*(2), 79–83.

[4]. Rao, A., & Krishnan, M. (2024). The Role of SNOMED CT in Enhancing Clinical Decision Support Systems. *Global Journal of Medical Terminology Research and Informatics*, *2*(3), 8-11.
[5]. Tkachenko, D., Shevchenko, O., & Melnyk, A. (2024). A Comparative Analysis of the Role of Festivals and Events in Destination Branding. Journal of Tourism, Culture, and Management Studies, 1(1), 36-43.
[6]. Vora, S., & Mishra, S. (2024). Human AI Collaboration for Ethical Decision-Making in Autonomous Systems. *International Academic Journal of Science and Engineering*, *11*(2), 47–50. https://doi.org/10.71086/IAJSE/V11I2/IAJSE1150
[7]. Sadulla, S. (2024). State-of-the-art techniques in environmental monitoring and assessment. *Innovative Reviews in Engineering and Science, 1*(1), 25-29. https://doi.org/10.31838/INES/01.01.06
[8]. Nejad, H. Z., & Fard, K. D. (2019). Basic Pattern of Decision - Making of Sustainable Development in Education Policy (of the Ministry of Education). *International Academic Journal of Social Sciences*, *6*(1), 166–177. https://doi.org/10.9756/IAJSS/V6I1/1910016.
[9]. Muralidharan, J. (2024). Advancements in 5G technology: Challenges and opportunities in communication networks. *Progress in Electronics and Communication Engineering, 1*(1), 1–6. https://doi.org/10.31838/PECE/01.01.01
[10]. Mansour, R. (2024). A Conceptual Framework for Team Personality Layout, Operational, and Visionary Management in Online Teams. *Global Perspectives in Management*, *2*(4), 1-7.
[11]. Poornimadarshini, S. (2025). Cyberfeminism 4.0: The role of social media and digital platforms in shaping contemporary feminist activism. Journal of Women, Innovation, and Technological Empowerment, 1(1), 25–30.
[12]. Iyer, S., & Trivedi, N. (2023). Cloud-powered Governance: Enhancing Transparency and Decision-making through Data-driven Public Policy. In *Cloud-Driven Policy Systems* (pp. 13-18). Periodic Series in Multidisciplinary Studies.
[13]. Wang, H., Lin, L., Huang, H., Zhao, L., Lian, Z., & Su, C. (2025). WiFi-based Intelligent Wireless Sensing for Privacy-Preserving Human Behavior Recognition under AIoT Architecture. *Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications, 16(1),* 104-120. https://doi.org/10.58346/JOWUA.2025.I1.006
[14]. Zghair, S. A. A., & Doghri, S. B. S. (2025). The Effectiveness of Administrative Communications in Achieving Quality in Administrative Decisions through Management by Walking Around. *Indian Journal of Information Sources and Services*, *15*(1), 124–138. https://doi.org/10.51983/ijiss-2025.IJISS.15.1.17
[15]. Aguila, C. I. G., Arellano, M. D. P. C., Castro, M. D. P. Q., Mondragón, E. M. B., & Castro, G. A. Q. (2024). Examining Artificial Intelligence and Law as a Tool for Legal Service, Decision-making, Job Transformation, and Ethical Performance. *Journal of Internet Services and Information Security, 14*(3), 99-115. https://doi.org/10.58346/JISIS. 2024.I3.006
[16]. Madhanraj. (2025). Predicting nonlinear viscoelastic response of stimuli-responsive polymers using a machine learning-based constitutive model. Advances in Mechanical Engineering and Applications, 1(1), 41–49.
[17]. Vardhan, H., & Bhattacharya, R. (2025). The Impact of Sustainable Practices on Business Performance. *International Journal of SDG's Prospects and Breakthroughs*, *3*(1), 15-21.
[18]. Nakamura, H., & O'Donnell, S. (2025). The Effects of Urbanization on Mental Health: A Comparative Study of Rural and Urban Populations. *Progression Journal of Human Demography and Anthropology*, *3*(1), 27-32.