Journal of Production, Operations Management and Economics
Vol: 06, No. 01, Jan-June 2026
ISSN: 2799-1008, DOI: 10.55529/jpome.61.35.46

Research Paper

Business analytics in managerial decision-making in emerging economies: evidence from pakistan

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Article Info

Article History:
Received: 21 September 2025
Revised: 02 December 2025
Accepted: 09 December 2025
Published: 28 Jaunary 2026

Keywords:
Strategystrategic
Management
Decision Making
Business Analytics
Rbv
Pakistan

ABSTRACT

Firms in emerging economies are increasingly investing in business analytics (BA) capabilities to strengthen their decision-making processes and move toward more evidence-based organizational governance. This study employed a qualitative research design using semi-structured interviews to gather in-depth perceptions from 15 top managers employed in large Pakistani firms. The findings reveal that top managers in Pakistan primarily rely on BA output to monitor business performance against established targets and to guide short-term corrective measures. For more complex, future-oriented strategic decisions, top managers supplement BA-derived knowledge with non-analytical knowledge sources, including stakeholder consultations, industry expert opinions, and contextual judgments shaped by local market dynamics. This study contributes to the emerging literature on business analytics value in developing economies by documenting the purposes and rationales underlying top management 'sBA use in Pakistan.

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1. INTRODUCTION

According to the RBV, competitive advantage is the result of a firm's capability to recognize, create, and utilize resources in a manner that is difficult for others to imitate [1]. Top managers (TM) occupy the peak of this resource management activity and are responsible for ultimate decision-making regarding

Journal of Production, Operations Management and Economics (JPOME)

how organizational resources can be acquired, configured, and deployed [2]. As such decisions are knowledge-based, the quality and appropriateness of the information accessible to TMs determine the firm's strategic direction [3].

Digitalization has essentially changed the information environment of modern organizations. Companies can now access more data than ever before, created up and down their chains of value, at their customer contact points, and in their competitive arenas [4]. Business analytics (BA), including descriptive, diagnostic, predictive, and prescriptive business analytics, has provided companies with the capability to transform such data to formulate operational knowledge [5]. In turn, companies in developed and developing economies have significantly increased their investments in BA to achieve gains in the speed, accuracy, and coherence of decision-making [6].

Pakistan is one of the largest and fastest-developing economies in South Asia; therefore, the study of BA use in managerial decisions is especially interesting in the country. Institutional complexity, regulatory uncertainty, accelerated adoption of digital technologies, and increasing competition pressure from domestic and foreign competitors define the environment of Pakistani firms [7]. In this context, major Pakistani companies have started to invest heavily in digital infrastructures and analytics capabilities; however, it is still not clear how well the top management utilizes these capabilities [8]. As shown in Figure 1, the rapid growth of digital infrastructure investment in Pakistan has created a foundational environment that is increasingly conducive to BA adoption among large enterprises.

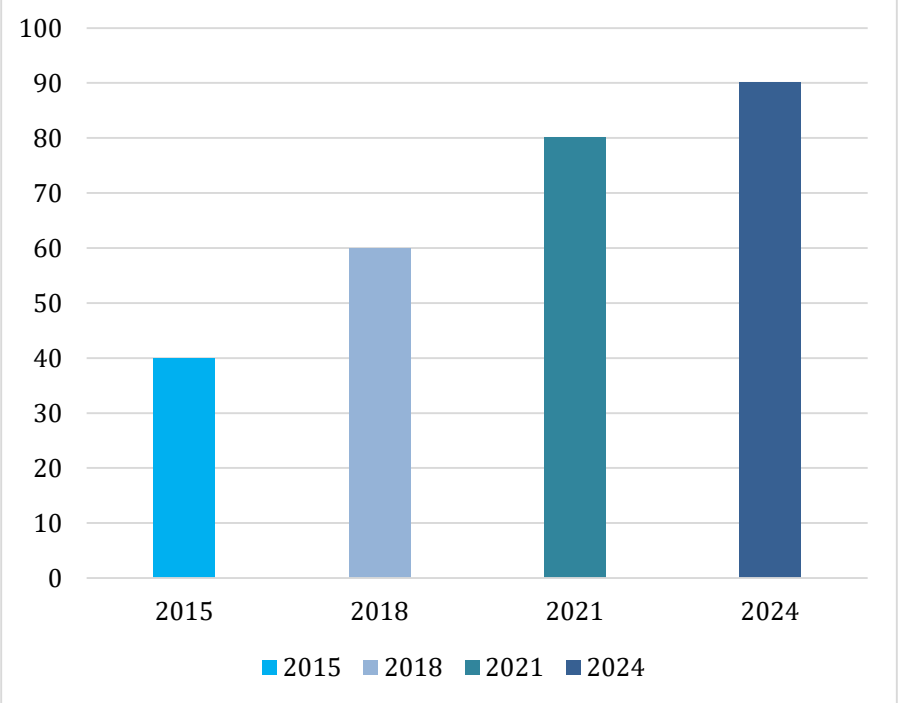

Figure 1. Conceptual overview of Business Analytics Adoption Drivers in Pakistani Enterprises

In Figure 1 the academic knowledge regarding the application of BA to managerial decision-making processes has been generated in Western and high-income country backgrounds. Research on how TMs in emerging market's view, internalize, and implement BA is limited. This is a significant gap because the factors that define the formation of BA value, such as institutional settings, the way managers think, the maturity of data infrastructure, and cultural beliefs regarding the use of evidence, might be significantly different among national settings [9]. Knowledge of how Pakistani TMs employ BA and why is thus relevant to both theory and practice. As shown in Figure 2, the conceptual framework of this study positions BA use within a broader ecosystem of institutional, organizational, and individual factors that are unique to emerging economy contexts.

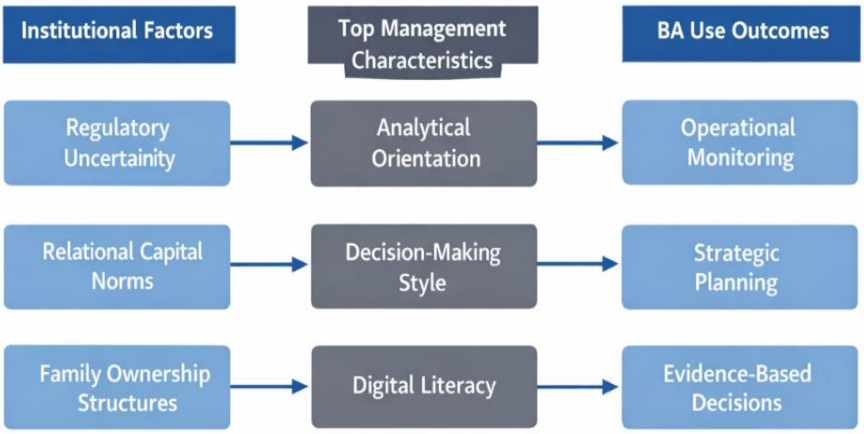

Figure 2. Conceptual Framework Illustrating the Relationship between Institutional Factors, Top Management Characteristics, and Business Analytics use in Pakistani Firms

In Figure 2 the overall conceptual framework has been discussed in relvence with BA use in Pakistan. This study addresses two research questions to fill this gap. First, when TMs in large Pakistani companies apply BA in their decision-making will be investigated. Second, why they would want to interact with it is examined. The answers to these questions are provided in the form of 15 detailed semi-structured interviews with top leaders who have strategic decision-making roles in various industries. The remainder of the paper discusses the review of the theoretical background, description of the methodology, presentation of the empirical results, and a conclusion that places our results within the overall literature.

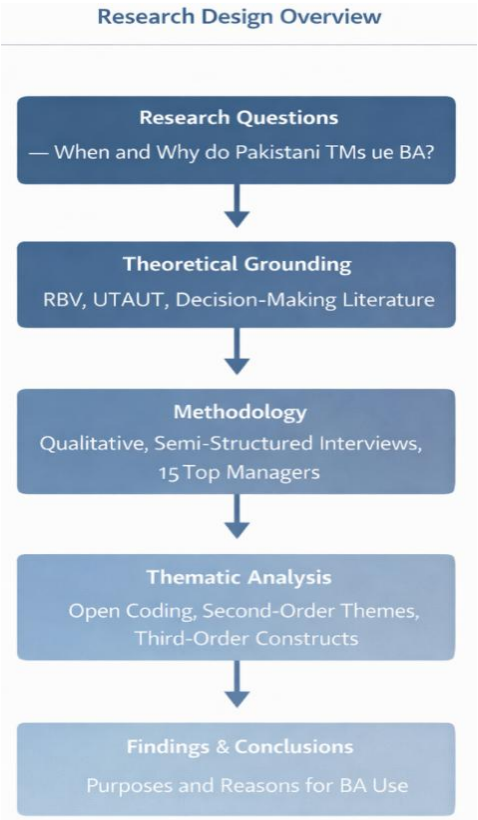

Figure 3. Overview of the Study's Research Design and Flow from Research Questions through Methodology to Findings and Conclusions

As shown in Figure 3, the study's structure follows a well-established qualitative research process from theoretical grounding through empirical inquiry to thematic synthesis.

The significance of this study extends beyond the Pakistani context. Emerging economies across Asia, Africa, and Latin America share many of the institutional and cultural characteristics that define the Pakistani business environment, including regulatory volatility, relational governance norms, and varying levels of digital infrastructure maturity. By generating rich empirical evidence from Pakistan, this study contributes to a broader theoretical conversation about how BA value is created and sustained in contexts that differ substantially from the Western organizational settings in which most BA research has been conducted. The insights from this study are thus relevant to researchers, practitioners, and policymakers engaged with the challenge of building analytics-driven organizations in resource-constrained and institutionally complex environments.

2. RELATED WORK

2.1 Managers and Firm Decision-Making

Firm performance does not solely rely on the resources that a firm holds, but rather on the effectiveness with which the resources are managed and utilized over time [1]. Changing competitive environments demand that firms change their resource structures, such as divesting from resources with decreasing returns and investing in resources that provide future competitive advantage [9], [10]. Those firms that are very successful in this kind of dynamic resource management activity are likely to have far-out performances in relation to other rivals [1], [1].

Resource management contains a variety of decisions of varying complexities, newness, and information needs [11]. Routine decisions are those based on familiar situations, in which familiarity with the options and their implications can be accommodated by systematic procedures or even automation [11], [11]. In contrast, non-routine decisions are characterized by a high level of novelty or uncertainty, and decision-makers can not depend on heuristics; instead, they must undertake strenuous exploration of options while considering possible effects [9].

Most of the decisions that TMs have to make fall into the latter category. In strategic choices related to the distribution of resources, entry mode, capability building, or restructuring of the organization, there is significant uncertainty regarding the future of the external environment as well as the firm's internal capabilities [12]. Consequently, to make these decisions, TMs must rely on a variety of knowledge bases, few of which include historical data, expert judgment, stakeholder input, and intuition [12]. The difficulty lies in combining these sources productively, particularly when they point in different directions [13].

In Pakistan, in particular, TMs have to deal with other tiers of complexities. Regulation systems are shifting quickly, the quality of infrastructure changes significantly across the country, and even informal networks and relationship capital have a significant impact on business performance, in addition to official statistics [7]. Such contextual characteristics define the decision environment in a manner that can alter the nature of decisions that TMs encounter, as well as the mode through which they make their decisions [8].

TMs also work under the organizational control and hierarchical structures that influence decision-making roles and responsibilities. At the level of group or subsidiary management teams, managers are normally responsible for making decisions that impact the resource constellation of their areas of dealings [13], [13]. Their tasks are divided into external and internal analyses, strategy development, control of its implementation, and monitoring of its performance [14], [15]. All these activities characterize the landscape in which BAs can deliver value.

2.2 Purposes for Using Business Analytics in Managerial Decision-Making

Various activities are involved in the strategic management process, which, when combined, form the competitive position and configuration of resources of the firm in the long run [14]. These include environmental scanning, strategy development, setting of targets, monitoring, and implementation of corrective actions when performance is not on course [15]. BA has the potential to assist all these activities, although its role and level of contribution to them can differ and fall on both ends of the decision-making spectrum [5]. On the operational end of the decision spectrum, BA performs well in tracking performance

against set targets, detecting deviations, and facilitating the choice of corrective action [16]. The empirical data produced by operational systems are valuable to these analyses, as they help TMs to stay aware of the situation in their respective areas of work without having to collect a lot of information manually [17]. These applications are well-established in the literature and tend to be universal across organizational settings [6].

There are more problems at the strategic end of the decision-making spectrum in BA. Strategic decisions are made with reference to unpredictable future conditions, new strategic choices, and judgments concerning the organizational capacity that do not particularly manifest themselves in available data [18]. Such decisions can be extended to scenario analysis and simulation modelling; however, these types of analysis involve assumptions based on the future of the situation, and uncertainty is always introduced by uncertainty [19]. These challenges may be aggravated by the speed and unpredictability of environmental change in emerging economies such as Pakistan, so BA output can be a helpful but inevitably incomplete contribution to the strategic decision-making process [19].

Recent research has started to report a more debilitated view of the involvement of BA in the approach to management, whereby analytical output is not an algorithm for making a choice but a part of many that go into a highly extended procedure of deliberation [17], [17]. It seems that TMs build on BA-based insights, add tacit knowledge to them, stakeholder views, and situational judgment to come up with decisions that capture the entire complexity of the strategic dilemma before them [9]. One of the key interests of this study is to understand how this integration takes place in the Pakistani context.

2.3 Reasons for Using Business Analytics in Managerial Decision-Making

The question of why managers use BA differs from the question of when or how they use BA. Various bodies of literature have addressed this question by taking a varied theoretical approach. Technology acceptance models, including the Unified Theory of Acceptance and Use Technology (UTAUT), focus on performance expectancy, effort expectancy, and social influence as the reasons behind people's adoption of technology [8], [20]. When applied to BA, these frameworks imply that TMs will utilize analytical tools to the extent that they believe that BA will improve their performance in decision-making, that interacting with it is practical to incorporate into their working processes, and that their colleagues and managers in the organization also appreciate BA use [18], [6].

Outside these generic adoption drivers, research has focused particularly on the managerial use of BA and has identified specific decision factors. Managers testify that they use BA to reduce uncertainty and increase the factual basis of their decisions [18], [6]. They also apply it to validate decisions for superiors, colleagues, and boards, providing an evidential source for making choices, which may otherwise be subjective [21]. In addition, BA may allow uncovering new horizons or inconsistencies in the data that might make managers rethink previous assumptions, which is a cognitive challenge that can be beneficial [21].

Organizational expectations also play a role. Companies that have high investments in BA infrastructure usually anticipate their top-level management to be the leaders of its application, both in their deeds and in the organizational culture and norms they set as examples [21]. In some companies, TM interaction with BA is at least partially normative in the sense of what it takes to be an effective executive in an organization with the capability of analytics [21]. Such organizational social and cultural expectations can be especially compelling in Pakistani organizations, where top-down power and role-based demands have a significant effect on managerial behavior [8].

Managerial confusion and decision-making styles also determine BA utilization due to individual differences. Analytically oriented managers who are more data literate (or technologically self-efficacious) tend to be more inclined to pursue BA actively and successfully [13], [20]. In contrast, managers with high intuitive decision-making styles or less exposure to BA might be more discriminating in using analytics, mainly relying on personal judgment and treating the output of analytics as a checkpoint [13]. These differences at the individual level also add value to the heterogeneity of BA patterns used within and among different organizations.

Drawing on these theoretical foundations, this study explores TM BA use in large Pakistani firms through two key research questions.

- RQ1. When do TMs in large Pakistani firms use BA?
- RQ2. Why do TMs in large Pakistani firms use BA?

3. METHODOLOGY

3.1 Research Approach

This study relies on a qualitative research concept based on abductive logic, which enables us to pass between the concepts and hypotheses of the empirical findings [22]. The sparsity of previous research on the use of BA in the Pakistani managerial setting justified the qualitative research design, as it allowed us to develop an informed perception, as opposed to proving specific hypotheses [22]. After examining the available literature on BA application in organizational decision-making and specific situations in Pakistani corporate settings, our present research developed a semi-structured interview protocol as the main measure of data collection [23].

3.2 Data Collection and Handling

Semi-structured and individual interviews were also utilized as the main form of data collection, as they provided thematically structured, but verbally free, conversations between interviewers and participants [23]. This type of interview is ideal for obtaining rich and experience-based responses from senior managers, who can describe the particulars of their BA usage in a manner that is not possible using structured surveys [23]. The interview guide was created through a gradual series of discussions with pilots and had four thematic areas:

- The informant's managerial role and overall orientation toward decision-making;
- The informant's perceptions of the BA's organizational benefits and challenges;
- The informant's direct experience with BA use in planning and strategic decision-making; and
- The informant's personal motivations and expectations regarding BA use.

Six heads in business units, five heads in functions, and four heads in strategy formed the interviewees Table 1. Each session lasted an average of 58 minutes and was tape-recorded with the consent of the participants and later transcribed verbatim. All participants received full anonymity, and their identifying information was substituted with generalized descriptors during the analysis and reporting stages.

Table 1. Interview Statistics

Identifier	Type of Responsibility	Industry Sector	Interview Type	Language	Duration (Min)
A	Head of business unit	Manufacturing	Onsite	Urdu	62
B	Head of strategy	Financial services	Onsite	English	55
C	Head of strategy	Telecommunications	Onsite	English	60
D	Head of business unit	FMCG	Onsite	Urdu	72
E	Head of function	Energy	Onsite	Urdu	51
F	Head of business unit	Retail & e-commerce	Onsite	English	58
G	Head of function	Manufacturing	Onsite	Urdu	64
H	Head of strategy	Financial services	Online	English	49
I	Head of business unit	Logistics	Onsite	Urdu	56
J	Head of function	Healthcare	Onsite	Urdu	61
K	Head of strategy	FMCG	Onsite	Urdu	53
L	Head of function	Telecommunications	Online	English	47
M	Head of business unit	Energy	Onsite	Urdu	65
N	Head of function	Retail & e-commerce	Online	English	52
O	Head of business unit	Healthcare	Onsite	Urdu	59

3.3 Data Analysis

The analysis of the interview transcripts was conducted using a three-stage data coding strategy that is in line with standard qualitative methods in management research [24]. In the initial step, open coding was used on all transcripts to develop first-order categories that reflected the content of the participants' descriptions of their BA use [24], [22]. These preliminary categories were retained as they were close to the words and frames of the participants, and the richness of the data in the context was maintained. All Urdu–English translations were performed by other members of the research team who were bilingual and ensured that the translations were semantically correct.

In the second stage, the first-order categories were corrupted into second-order themes in the form of cross-case comparisons and continued reflections against the existing literature [24]. This step entailed repeated deliberations by all three authors and specific attention to categories that seemed specific to the Pakistani situation, such as those involving the role of personal relations, regulatory demands, and family ownership patterns in influencing BA use. Third-order constructs were subsequently created to reflect larger era trends within the themes.

4. RESULTS AND DISCUSSION

4.1 Top Manager Perceptions on When to Use Business Analytics

4.1.1 Follow-Up and Adjustments in Business and Operations

Throughout the interview data, TMs repeatedly spoke about BA as the key tool by which they maintain real-time performance of their business unit or business sector. Vital elements of daily management were outlined in monitoring dashboards, automated reports, and exception-flagging systems that were established on the BA infrastructure. Interviewee A verbalized this direction:

In my case, analytics is not an option but a prerequisite. Unless I have reviewed the numbers before walking into a review meeting, I feel that I am walking in the dark. I have made a habit of checking the dashboards every morning. Regional sales, margin sales, product category sales, customer complaint/solve time. These are the beating of the business.

In addition to regular monitoring, BA allows TMs to detect performance deviations and develop corrective actions quickly. Interviewee D explains that BA offers operational decisions in various business spheres simultaneously.

There are 12 distribution regions. At the end of every month, BA informs me about the ones that are not performing in terms of volume, those that are experiencing a decline in their margins, and those that are receiving poor customer satisfaction feedback. This triangulation cannot be done manually at my level. It becomes manageable through analytics and helps me understand where I will have to concentrate and where I can rely on my team to take it up.

The area of functional monitoring is naturally dependent on the functional mandate of the TM. Business unit heads are likely to track overall business performance composites based on revenue, margin, and customer measures. Functional chiefs are better defined around the measurements most applicable in the sphere, such as supply chain performance, human resources effectiveness, or political campaign payoff. Interviewee G, a head of manufacturing operations, explains how BA has changed his management of the manufacturing operations in an environment whereby local supply chain breakdowns are typical.

4.1.2 Mid-Term Monitoring, Planning, and Decision-Making

The BA is also an important component in the activities of medium-term planning, such as annual budget cycles, project planning, and road mapping product development, and investment timing. These actions have a more extended planning horizon than daily operational scrutiny and involve the incorporation of trend information, forecasting models, and inter-functional fresh streams. Interviewee F explains that the BA supports the annual planning cycle within her company:

The first stage of our planning has become practically analytics-driven. We access three years of performance, divide it into individual product, channel, and customer cohort performance, and apply predictive models to each segment. This provides us with a data-based starting point before we

superimpose judgment concerning strategy. It has minimized the noise in our planning conversations to a great extent.

Another aspect brought out by the mid-term planning context is the relevance of BA in investment planning and capital allocation. Interviewee I, Head of Business Unit in a logistics company, explains how the output of BA is used to determine the timeline of investment in warehouse infrastructure:

We are continually making decisions regarding where to invest in new sorting and warehousing capacity. Analytics uses predictive models to project our growth volumes relative to regions in the next two years. This informs us of where we will cross demand barriers and thus, we can schedule our capital spending to arrive slightly ahead of the demand and avoid congested situations.

In the descriptions of mid-term BA usage, product planning was also an important aspect of TMs. Here, BA can be used in the context of FMCG and retail to analyze the performance of individual product lines in a granular way, the slow-moving lines, preempting indicators of shifting consumer preference, and estimating the revenue value of portfolio changes, as summarized in Table 2.

Table 2. Purposes for using BA

First-Order Categories	Second-Order Themes
Monitoring product and asset-related operations Monitoring sales performance and channel effectiveness Monitoring customer acquisition, retention, and satisfaction	Business and operations follow-up and decisions on improvement activities
Annual budget planning and variance analysis Capital investment planning and timing Product portfolio planning Project planning and milestone tracking	Mid-term monitoring, planning, and decision-making
Long-term market sizing and demand forecasting Macroeconomic and regulatory scenario modelling Demographic and trend analysis	Long-term planning and scenarios
Mergers, acquisitions, and divestment decisions Market entry and exit evaluations Strategic partnership assessment	Strategic options evaluation and decision-making

4.2 Top Manager Perceptions on Why to Use Business Analytics

4.2.1 Reasons Linked to Organizational Expectations

Leveraging Digital Transformation: Similarities were also identified in the interviews, in which the adoption of BAs was framed as an organizational adaptation to the overall digital transformation experienced in the Pakistani economy. The fast spread of mobile network access, the development of data payment systems, and the appearance of data-branded e-commerce platforms have combined to establish the conditions in which companies that cannot build an analytics unit risk obsolescence [16]. Interviewee F explains how her firm has been transformed by digital transformation, which has totally changed the operating model:

Three years ago, the majority of our transactions were in cash, and we were practically non-existent in an electronic format. The modern world is nearly entirely digital. Data are produced every time a purchase is completed, a customer is contacted, and a return is made. There was no option but to develop analytical capacity, or the information would be useless, and our rivals who have developed analytical capacity would circle around us like flies.

Interviewee L, who works in the telecom industry, highlights the same point by stating that the changing behavior of customers that has been brought about by digitalization has introduced not only the opportunities of data, but has also brought forth analytical demands that did not exist a decade ago. The increasing availability of customer data in Pakistan, especially among younger demographic groups, has produced large volumes of data that must be interpreted using analytical tools and acted upon [8].

4.3 Discussion

These observations contribute to the existing knowledge of BA utilization in the decision-making of top management by placing it in the context of the specific institutional and organizational factors of a large emerging economy. They validate some of the patterns found in previous studies and add contextually sensitive dimensions that enlarge the conceptual space of BA use studies.

As other studies suggest, the key reason why Pakistani TMs interact with BAs is to monitor the performance of business operations in progress and swiftly address existing deviations in operational performance that must be rectified [5], [6], [20]. This observation endorses the fact that BA is in the middle of what can be referred to as the swap of resources in terms of control of firm resource management operations: the orderly management of available resources within the pre-existing parameters of operation [25]. In this case, BA acts as a real-time institutional memory, which allows TMs to maintain awareness of the situation in complex, geographically dispersed operations [11].

In the Pakistani context, the operational value of BA in any case is increased by the higher occurrence of supply chain disruptions, currency fluctuations, and governmental changes, which typify the nation's business environment [23]. In this respect, TMs do not utilize BA to track stable operations; instead, they utilize it to predict and outposition disruptions that would occur without analytics and would only manifest as operational crises. Such a proactive orientation introduces risk management as a factor to the operational value of BA, which is less eminent in the results of more stable economic settings [8].

To organize medium-term planning and budgeting activities, the BA is identified as the main data platform upon which the planning activity is based, and this observation aligns well with the current literature on the role of the BA in organizational planning cycles. It can be assumed that using historical performance data, forecast modeling, and cross-functional analytics in the annual budgeting and investment planning processes has become standard in large Pakistani firms, as in our sample, which can be seen as being in a relatively mature stage of operations planning.

5. CONCLUSIONS

This study was conducted to determine when and why top managers of large Pakistani companies use business analytics in their decision-making. The study records a pattern of BA utilization of thirty operational monitoring, medium-term planning, long-horizon scenario analysis, and strategic option evaluation that spans several industries and through in-depth interviews with thirty TMs who are responsible for strategic decision-making. It classifies eight causes of BA usage, which can be classified into organizational and individual expectations, and introduces a governance and compliance aspect that adds to the previous literature and a cultural change-enabling aspect that specifically addresses the Khorasani business environment in the well-known corporate world.

5.1 Implications

This research is important to theorists as it is an empirical report on how TMs can strike a compromise under an emerging economy setting in the application of analytics in resource-based decision making. It increases the demand for context-sensitive BA research by showing how aspects of the Pakistani business environment, such as institutional uncertainty, relational capital norms, family ownership structures, and regulatory forces, influence not only the purposes of TM application but also the motivations that drive TM application. It also recreates and confirms the discovery that, even in organizations with established BA skills, strategic decision-making continues to be dominated by humans, indicating that the factor of analytical versus deliberative decision-making is strong between nations.

5.2 Limitations and Future Direction

This study has a few limitations, and these should be taken into consideration when interpreting the findings and planning further studies. The sample was suitable in that it was based on large firms in major metropolitan centers in Pakistan, but was appropriate for a qualitative investigation. Smaller cities or rural areas are not represented, in which firms may have significantly different conditions of data infrastructure. Similarly, the sample mainly covers areas of the economy where digitalization curves are rather progressive; the results may not be the same in areas of the economy that have not yet reached this level of development, such as in agriculture or small-scale manufacturing. This study provides several avenues for future research. First, the governance and compliance aspects of BA application identified here could be subject to specific theoretical and empirical focus, not only in Pakistan, but also in other emerging

economies where regulatory frameworks and enterprise ownership formulations define unique analytical requirements.

5.3 Supplementary Materials

The following supporting materials are available online. Figure S1: Interview guide used for semi-structured interviews with top managers. Table S1: Summary of first-order categories identified during open coding. Table S2: Cross-case comparison matrix of business analytics use across participating firms.

Acknowledgments

The authors would like to express sincere gratitude to all fifteen top managers who generously gave their time and shared their experiences during the interview process. The authors also extend their appreciation to the anonymous reviewers whose constructive comments significantly improved the quality of this manuscript.

Funding Information

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Author Contribution Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Muhammad Zahij Iqbal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Minal Zafar	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Muhammad Hamza Khan	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

Conflicts of Interest

The authors declare no conflict of interest.

Informed Consent

Informed consent was obtained from all individual participants included in this study. All participants were informed about the purpose of the research, their right to withdraw at any time, and the measures taken to ensure confidentiality of their responses. Each participant provided verbal and written consent prior to data collection.

Ethical Approval

This study was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments. Ethical approval was granted by the Institutional Review Board of the affiliated institution prior to the commencement of data collection. All participants were treated with full respect for their privacy and dignity throughout the research process.

Data Availability

The data that support the findings of this study are not publicly available due to participant confidentiality and privacy considerations. Interview transcripts contain sensitive organizational information and were collected under assurances of anonymity. Requests for de-identified data may be directed to the corresponding author, subject to institutional approval and applicable data protection regulations.

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How to Cite: Muhammad Zahij Iqbal, Minal Zafar, Muhammad Hamza Khan. (2026). Business analytics in managerial decision-making in emerging economies: evidence from pakistan. Journal of Production, Operations Management and Economics (JPOME), 6(1), 35-46. https://doi.org/10.55529/jpome.61.35.46

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