

Influence of Big Data Analytics Capability on Employee Creative Behavior: A Modified Mediation Model

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Abstract—The purpose of the present study was to assess the effect of Big Data Analytics capabilities on employees' creative behavior in the Jordanian service sector and to explore the mediating influence of employee curiosity and the moderating influence of top management support. The proposed model was developed using an integrative theoretical framework, namely the knowledge-based view (KBV) and Self-Determination Theory (SDT), to understand how knowledge resources translate into creative behaviors through psychological motivations and organizational context. Data for this quantitative research were collected from a population of 326 employees working in SMEs operating in the Jordanian service sector. Statistical analysis of the collected data was performed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings have confirmed the direct positive influence of big data analytics capabilities on creative behavior, alongside an indirect one via employee curiosity as a mediating factor. It was also found that senior management support has a negative moderating effect on the relationship between big data analytics capabilities and employee curiosity. This research study adds value to the body of knowledge by combining two theoretical frameworks that relate cognitive resources, psychological motivations, and organization in the explanation of creativity in the digital business context.

Keywords—Big data analytics; employee creative behavior; curiosity; management support; the knowledge-based view and self-determination theory

I. INTRODUCTION

Considering the rapid digital revolution that is currently happening in the world of international business, big data analytics has become one of the key resources that are essential to operations, effectiveness, and execution [1]. Nowadays, data has become the basis through which creative performance can be achieved in organizations, especially in the field of services, where human capital becomes the main tool for delivering value [2].

It should be noted that the service sector in Jordan and its SMEs offer a perfect platform to learn how to use technical abilities to generate proactive results, such as innovative ones [3]. Nevertheless, the knowledge about the influence of big data analytics on creativity, especially under appropriate conditions, needs to be further developed. It is also critical to study the various levels of digital readiness required to achieve excellence in comparison with developed nations.

This significance is associated with the gap theory of knowledge, which suggests that knowledge is the most precious resource of the enterprise; therefore, creating and applying knowledge should be a mutual task [4]. Thus, from this perspective, big data analytics is not a set of technical possibilities, but rather a system that allows the organization to turn data into knowledge to improve the ability of its staff to think creatively and rationally [5].

Nevertheless, the conversion of such resources into creative products requires special efforts, as it is conditioned by internal psychological factors specific to the individual. That is why self-determination theory becomes very important in this situation, since it states that the key motivation to engage in creativity is internal, based on curiosity, exploration, capability, and freedom [6]. In simple terms, an employee's curiosity is a psychological factor that helps him/her to use data to develop creativity.

In addition, the arrangement of the working environment itself can have an equally crucial impact on how these relations are established. Depending on how support from top management is exercised, this support will either strengthen or weaken the above processes [7]. Empowering support will foster empowerment and encourage employees to explore, whereas directed support may not limit freedom as much as intrinsic support does, thereby influencing curiosity levels in the organizational context [8]. For that purpose, the goal of this study is to examine the potential abilities of data analytics to catalyze creativity in the Jordanian service sector. In particular, this will be done through investigating the modern mediating effect of employee curiosity as well as the position held by top management in a unified framework consisting of both epistemological and motivational theories.

II. LITERATURE REVIEW

A. Employee Curiosity and Creative Behavior

One of the most important psychological factors behind the phenomenon of creativity in business organizations is employee curiosity [9]. This is because curiosity implies the nature of human beings to be explorative in nature, to understand the phenomena around them, and to experiment with new and different ideas or ways of doing things. Thus, curiosity broadens the perspective of an employee and allows him or her to think of innovative solutions to organizational problems [10].

From the theoretical point of view, the above link between employee curiosity and organizational creativity can be understood in the light of Self-Determination Theory (SDT). As per SDT, curiosity, being one of the intrinsic motivating factors, helps individuals become mentally flexible and generate new innovative ideas [11]. Additionally, curiosity drives individuals to constantly pursue knowledge, test out new ways of doing things, and engage in contact with multiple sources of information. It results in the creation of cognitive experience that can eventually be integrated into the formation of innovative solutions to problems. Cognitive diversity resulting from it is arguably one of the most essential elements that stimulate creativity within today's complicated working environment.

On the other hand, individuals who possess curiosity are inclined to be more courageous intellectually, experiment, and play around with ideas. Intellectual risk-taking and experimenting are among those activities associated with creativity. In essence, curiosity directly contributes to an individual's exploratory behavior, which results in innovation [9].

In an organizational setting, individuals who possess high levels of curiosity frequently play a role in enhancing organizational processes, services, and innovations in relation to organizational problems. This implies that curiosity is not just an individual's characteristic but rather a behavioral resource that facilitates creativity at work.

Thus, it can be argued that the effect of curiosity on employee creativity lies in enhancing the breadth of thought, encouraging exploratory behavior, and engaging in experimentation.

H1: There is a positive relationship between employee curiosity and creative behavior

B. Big Data Analytics and Employee Curiosity

This implies that the curiosity of the employee is a key element in motivating people to explore and question in order to gather knowledge about the surroundings. With the development of modern workplaces, the curiosity of employees is one of the factors that influence how employees relate to the vast amount of information available to them.

The use of big data analytics plays a major role in enhancing the curiosity of the employee by ensuring that the working environment is information-rich and full of analytics [12]. With the availability of information and data, junior employees become curious about the information present and make an effort to analyze the data at hand. Such action results in more data being generated, leading the employee to look out for announcements, thus increasing their curiosity [12].

This is the point when the theory of self-motivation (self-determination theory) becomes an important factor in fostering curiosity, combined with the presence of information from a cultural perspective and the competence and independence of our employees [13]. Once employees see that they can analyze data and understand their work, they become more motivated to learn continuously. Moreover, the implementation of powerful data analytics technologies like interactive dashboards and artificial intelligence fosters interaction between the employees

and data. In turn, it promotes greater engagement and constant questioning of the findings and phenomena.

Moreover, an organizational setting that highly depends on big data is likely to encourage workers to engage in data exploration on their own, rather than depend only on the pre-made reports. This results in cultivating a sense of curiosity among workers. From this perspective, it could be stated that the ability to conduct data analysis is significantly more effective in promoting employee curiosity through an environment rich in information and interactions with data.

H2: There is a positive relationship between big data analytics and employee curiosity

C. The Moderating Role of Top Management

The results showed that senior management support plays a moderating role in the relationship between big data analytics capabilities and employee curiosity, suggesting that the impact of analytical capabilities depends not only on the availability of technology and data but is also influenced by the organizational environment provided by senior management. This finding is consistent with previous studies that have emphasized the importance of senior management support in creating a suitable environment for leveraging data analytics capabilities [14].

This result can be explained in light of self-determination theory, where forms of support that promote employee autonomy contribute to the development of intrinsically motivated behaviors, such as curiosity and exploration. When senior management provides the necessary resources, access to data, and encourages the free use of analytical tools, employees become more capable and willing to explore information and search for new patterns, thus strengthening the impact of big data analytics capabilities on their curiosity.

Conversely, controlling or centralized support may limit employee autonomy and reduce their desire to explore. Therefore, the result demonstrates that how senior management support is provided is just as important as the support itself, and that a managerial environment that fosters autonomy can enhance the behavioral value of big data analytics capabilities. Thus, the study provides evidence that senior management support is an important organizational factor in transforming analytical abilities into higher levels of employee curiosity.

H3: Top management moderates the relationship between big data analytics and employee curiosity

D. The Mediating Role of Employee Curiosity

Curiosity stands for the psychological intermediary between the capabilities of big data analytics and creative activities performed by employees. Although KBV offers knowledge necessary for analyzing and accessing the data [15,16], SDT explains how this knowledge becomes converted into actions through intrinsic motivation.

Thus, big data analytics do not have a direct effect on generating creativity, but their initial effect involves stimulating employee curiosity. This will make the employee interested in the data and motivated to discover new relationships and think up innovative solutions based on them [17,18].

H4: Employee Curiosity will mediate the relationship between big data analytics and creative behavior.

III. METHODOLOGY OF STUDY

A. Conceptual Framework

This research study identifies and evaluates the effect of big data analytics on the creativity of employees, considering the

effect of employee curiosity as a mediator and senior management support as a moderator in both large and small organizations within the service industry of Jordan. The conceptual framework of a cause-and-effect model states that there is a direct effect of big data analytics on academic performance, together with an indirect effect mediated by the curiosity of employees (Fig. 1).

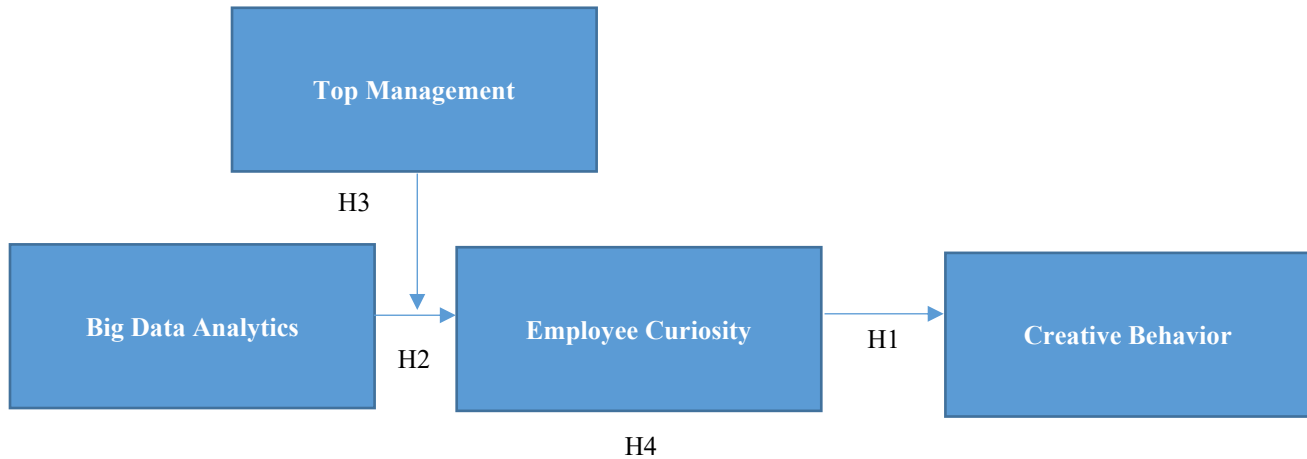


Fig. 1. Conceptual framework.

B. Design of Research

This type of research adopts a quantitative design with a descriptive analytical technique. This design is appropriate since the purpose of this research study is to test the relationships between variables of interest. A cross-sectional design has also been used, where information was collected from employees in both big and small firms operating within the service industry in Jordan at a single point in time.

C. Study Population and Sample

The study population comprised employees from small and large companies operating in the service sector in the Hashemite Kingdom of Jordan, given the increasing role of big data analytics in supporting operations and decision-making within this sector. Due to the lack of a comprehensive review framework, a non-probability convenience sampling method was employed, selecting key participants based on feasibility and availability. Sample size was confirmed, and a statistical power analysis was performed using G*Power software before model testing. Based on the number of predictors in the simple model, the significance level ($\alpha = 0.05$), and the baseline statistical power ($1-\beta = 0.80$), the analysis revealed that the required threshold for sample size was less than the actual sample size of 326 cancellations. Therefore, the statistical overshoot size used was the required size, representing statistical power relevant to the relationships and pathways in the proposed model. After excluding incomplete responses, 326 valid responses were selected for final analysis.

D. Measurement

The variance in studies has been conducted via a questionnaire that was designed based on some criteria that have been followed in earlier studies, but with slight changes depending on the service sector in Jordan. The main constructs

used in the survey include big data analytics skills, employee curiosity, management support, and creative behavior. All variables were analyzed using a Likert scale from 1 to 5, owing to research advancements in statistics.

E. Partial Least Squares (PLS-SEM)

Data analysis employed partial least squares structural equation modeling (PLS-SEM), with the use of the SmartPLS software program. PLS-SEM was deemed appropriate for the analysis due to the fact that it is preferred for natural complex analyses where there was involvement of several mediator variables, and due to the fact that it can measure average mean values without requiring a negative distribution.

The analysis has been carried out in two electronic phases. In the first phase, there was a test to evaluate the measurement model through convergent and construct validity and assessing internal consistency using Cronbach's alpha, composite reliability, and average extracted variance (AVE). In the second phase, evaluation of the structural model was done through analysis of path coefficients, coefficient of determination (R^2), effect size (f^2), and diagnostics (Q^2).

IV. RESULTS

A. Collinearity Analysis

Multiple correlations among innovations in the model were considered with respect to the Variance Inflation Factor (VIF) approach, which could be used to verify the presence or absence of any high correlation, making the model invalid. The results showed that all the values of the Variance Inflation Factor remained well within the scope of statistics, ranging from 1.950 to 2.410, but just below 5.000. Therefore, there was no multicollinearity problem in the data to apply the SEM approach (Table I).

TABLE I. INNER VIF VALUES

	Employee Curiosity	Creative Behavior
Employee Curiosity		1.000
Creative Behavior	1.114	
Top Management	1.073	
Big Data Analytics	1.150	

B. Assessment of Measurement Model

Initial analysis of the measurement model was carried out through validation and reliability of the instruments used in the study by analyzing Cronbach's alpha, composite reliability (CR), and mean variance (AVE) (Table II). All the acquisition levels surpassed the basic minimums, providing internal validity and reliability close to those of the instrument.

TABLE II. ASSESSMENT OF MEASUREMENT MODEL

Construct	Items (15)	Loading Factors	Cronbach's Alpha	Composite Reliability	AVE
Employee Curiosity	3	(0.700-0.807)	0.552	0.908	0.887
Creative Behavior	3	(0.739-0.871)	0.637	0.840	0.718
Top Management	3	(0.760-0.840)	0.649	0.847	0.732
Big Data Analytics	3	(0.851-0.932)	0.809	0.927	0.882

TABLE III. THE FOURNELL-LARKER CRITERIA

	Employee Curiosity	Creative Behavior	Top Management	Big Data Analytics
Employee Curiosity	0.743			
Creative Behavior	0.483	0.798		
Top Management	0.449	0.287	0.805	
Big Data Analytics	0.812	0.390	0.276	0.900

TABLE IV. HTMT CRITERION

	Employee Curiosity	Creative Behavior	Top Management	Big Data Analytics
Employee Curiosity	-			
Creative Behavior	0.612	-		
Top Management	0.571	0.354	-	
Big Data Analytics	0.824	0.468	0.331	-

C. Structural Model

The explanatory power of the model was assessed using the coefficient of determination (R^2). The R^2 value for creative behavior was 0.233, meaning that the model's independent variables explain approximately 23.3% of the variance in creative behavior, while they explain 72.8% of the variance in employee curiosity ($R^2 = 0.728$) (Table V). These results indicate that the model has high explanatory power for employee curiosity, while its ability to explain creative behavior is relatively limited. This is attributed to the fact that creative behavior is influenced by a wide range of individual, organizational, and contextual factors, not all of which may be covered by the current model. Therefore, the R^2 value of 0.233 does not necessarily indicate a weakness in the model, but rather suggests the presence of additional factors that may contribute to explaining creative behavior. Furthermore, the Q^2 values were greater than zero, confirming the model's predictive power with respect to internal variables.

The validity of the discrimination between the study variables was analyzed using the Fornell-Larcker criterion by comparing the square root of the extracted mean variance ($\sqrt{AVE}$) with the correlation coefficients between the variables (Table III). The results showed that $\sqrt{AVE}$ values were higher than most of the correlation coefficients between the variables, with a relatively high correlation between big data analytics and employee curiosity. To further validate the discrimination, the HTMT criterion was used, where all values were below the acceptable threshold (0.85), ranging from 0.331 to 0.824, with the highest value (0.824) between big data analytics and employee curiosity (Table IV). These results indicate acceptable discrimination between the study variables and no high overlap between them, supporting the validity of the measurement model.

TABLE V. R SQUARE

	R^2	Q^2
Creative Behavior	0.233	0.13
Employee Curiosity	0.728	0.35

From the results obtained, there was a positive and significant impact of big data analytics capability on creative behavior. Also, the results indicated that there was a positive influence on the behavior of curiosity among employees. Additionally, it is clear from the results that employee curiosity positively and significantly influenced creative behavior. It is clear that the senior management's supportive role negatively moderates the relationship between big data analytics capabilities and employee curiosity because the support reduces curiosity among the employees (Table VI).

TABLE VI. ASSESSMENT OF THE STRUCTURAL MODEL (PLS REGRESSION)

		β	t-value	p-value	f ²	Support
Direct effect	H1: Employee Curiosity → Creative Behavior	0.483	9.516	0.000	0.304	Supported
	H2: Big Data Analytics → Employee Curiosity	0.713	25.604	0.000	0.626	Supported
Moderate effect	H3: Moderator effect 1 (Top Management)	-0.120	4.110	0.000	0.056	Supported
Indirect effect	H4: Big Data Analytics → Employee Curiosity → Creative Behavior	0.344	9.558	0.000	-	Supported

V. DISCUSSION

The results of the study showed the existence of a positive effect of big data analytics on the creativity of workers in the Jordanian services industry. This indicates the existence of analytical bodies and institutions that help encourage creativity among workers. The finding may be attributed to the knowledge-based resource approach, where knowledge acquired through data analysis plays an instrumental role in the creation of value independently of the data itself. It can be said that the more an organization has the ability to analyze data and start from it, the greater the capacity of its workers to come up with ideas and innovative approaches to solving specific issues.

In addition, the research showed that big data analytics has an encouraging impact on the development of the curiosity of employees due to the fact that the diversity of information plays a motivational part. Such motivation can be justified through the application of the self-motivation theory (also called self-determination theory). In this case, big data and analysis help create independent and skilled workers, thus stimulating them to engage in learning and exploration by themselves. The modern analysis of interactive information elements creates opportunities for collaboration among users who are encouraged to look for relationships among the elements under analysis.

Therefore, the curiosity of employees is positively related to behavioral creativity. The curiosity of employees results in their tendency to think innovatively and use alternative ways to solve problems. Such a situation can be well explained by the expansion-construction model, according to which curiosity enhances the capacity of a person to think broadly so that he/she can come up with various creative ideas. Moreover, curiosity contributes to lifelong learning and gaining experience.

On another note, employee curiosity acts as a mediator in aligning critical capabilities of data analytics with academics. What this suggests is that data, whose impact on universities is all-inclusive, is not simply a straightforward process but involves a psychological process within organizations based on curiosity. In essence, the capabilities of modern-day data analytics are wide-ranging and specific; however, translating the process into creativity relies on the level of employee curiosity. Employees with curious minds can easily interpret complex data, generate new ideas, and develop solutions based on the analysis, while artificial intelligence might just measure employee curiosity.

In this case, it was found that although senior management support, along with the extent of curiosity resulting from it, adversely affects the relationship among the capabilities, key data analysis, and employee curiosity, this support can lead to a situation where the employees develop a certain amount of

curiosity that is more than required. This is because not all management support is enabling in nature, but can be supervisory and centralized in nature, which stimulates the explorative nature of the employees. As per the organizational climate theory, control environments lead to exploration and lack of internal focus, whereas supportive environments lead to curiosity.

Generally speaking, the quest for a correlation between data analytics and creative activities should not be regarded as static since there is a possibility that it may differ depending on the organizational context. In particular, big data analytics opens new opportunities for creative activities, while curiosity acts as a psychological factor that allows turning such capabilities into creative outcomes. At the same time, the management's attitude to such activities could act as a positive or negative determinant of the process depending on its style. Thus, this research study presents a much broader view of the issue in question.

VI. CONTRIBUTION OF STUDY

This research presents some valuable theoretical insights regarding the link between big data analytics capability and creativity among employees. First, the study helps fill a research void by incorporating employee curiosity into the research to act as a mediator in the causal pathway between the two constructs. Whereas existing studies have mainly examined the role of big data analytics from a technical point of view, few have sought to understand the psychological underpinnings of the link between the two constructs.

Secondly, the study makes use of various theoretical lenses, including knowledge-based view theory, self-determination theory, and broaden-and-build theory. The utilization of different theories allows for an understanding that creativity cannot be simply attributed to the availability of technical resources, but depends on motivational factors and supportive organizational environments.

Third, the research provides an important theoretical contribution regarding the moderating role played by the negative effect of support from senior management. The results indicate that support is not always considered a positively correlated factor, as in numerous past studies. Rather, it becomes a limiting factor in terms of promoting creativity within organizations when it involves elements of control and centralization. In addition, the theoretical contribution concerns the role of organizations in the processes of digital transformation in a broader context.

From the standpoint of practical significance, the study presents several recommendations for SME managers in the Jordanian services industry. The findings reveal that investing only in big data analytics skills and abilities will not promote

creativity in SMEs. Instead, the need for fostering such processes arises as long as the organizational context promotes curiosity and exploration. As a result, senior management should consider adopting an empowering approach that encourages workers to explore data freely, without restricting their actions to conventional means of processing information.

The article also shows the significance of developing curiosity in employees in order to use information as a means of innovation. It is possible to do so through proper training of the employees, fostering an environment where employees feel comfortable enough to ask questions and try out new things, and encouraging continuous learning. In addition, the findings also indicate the need for managers to review their approaches when supporting their employees, with an emphasis being placed on empowerment and encouragement.

VII. CONCLUSION

The purpose of this study was to investigate the effect of big data analytics capability on the creative behavior of the employees of the Jordanian service industry, as well as its mediating and moderating roles through curiosity of the employees and the support of the senior management. According to the findings, the big data analytics capability directly affects creative behavior and employee curiosity positively, and curiosity mediates its effect considerably.

On the other hand, the support of the senior management negatively moderates the relationship between the big data analytics capability and the curiosity of the employees. Thus, the non-empowering management practices prevent digital transformation from facilitating creativity in organizations. In summary, the current research highlights that modern organizational creativity depends on more aspects than technological advances and includes technical and psychological components.

With this in mind, the findings of the research reveal that for an organization to ensure creativity, it needs to create an environment where curiosity is cultivated, make sure that the big data analysis technique is used wisely, and shift the position of the managers in order to empower them rather than control them. This research paves the way for other researchers who may investigate the effects of other variables on the aforementioned relationships in the future.

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