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ANALYZING THE INFLUENCE OF LEADERSHIP STYLE ON EMPLOYEE ENGAGEMENT IN DIGITAL ECONOMY

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Abstract

This study investigates the impact of leadership styles on employee engagement in the digital economy, focusing on employees in Guangxi, China. Utilizing structural equation modeling to analyze data from 358 respondents, the research examines the effects of transactional and transformational leadership on engagement, with organizational commitment and psychological ownership as mediators. Results indicate a significant positive impact of leadership style on employee engagement, organizational commitment, and psychological ownership. Leadership style directly predicts employee engagement ($\beta = 0.80, p < .001$), while also influencing engagement indirectly through organizational commitment ($\beta = 0.25, p < .001$) and psychological ownership ($\beta = 0.39, p < .001$). These findings underscore the importance of leadership style in enhancing engagement within the digital economy, highlighting the mediating roles of organizational commitment and psychological ownership. This study contributes to the literature by elucidating the mechanisms through which leadership influences engagement in digital contexts, offering insights for leaders to foster a more committed and psychologically invested workforce.

Keywords: Leadership Style, Employee Engagement, Organizational Commitment, Psychological Ownership

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Introduction

The digital economy boom is fundamentally reshaping the global landscape, heralding a significant shift from an industrial to a digital economy and establishing digitization as a critical driver of high-quality economic growth (Chen et al., 2021). This transformation is not only redefining organizational structures and business models but is also compelling a strategic reevaluation of leadership styles to better align with the evolving dynamics of organizations and their employees. Despite the extensive body of research on leadership styles, the unique challenges and opportunities presented by the digital economy have not been fully explored, revealing a notable gap in the theoretical framework and underscoring the need for further investigation.

The effectiveness of leadership styles is deeply intertwined with their socio-economic context, which has been profoundly altered by the digital revolution. The emergence of technologies such as artificial intelligence, blockchain, and cloud computing has catalyzed a shift towards more agile and people-centric leadership models, reflecting the changing expectations of a digitally empowered workforce (Lin et al., 2021). In this new era, leadership must not only adapt to technological advancements but also foster an environment that enhances employee engagement, a critical determinant of organizational success. Employee engagement, as highlighted by Ma (2017), plays a vital role in the performance and development of enterprises, exerting a significant influence on job performance. This underscores the importance of understanding how leadership styles can be optimized to foster an engaged workforce, particularly within the context of China's rapidly evolving digital economy. The relationship between leadership style and employee engagement, however, is complex and may be mediated by factors such as organizational commitment and psychological ownership.

This study aims to concentrate on this intricate relationship within the digital economy, investigating how leadership styles influence employee engagement and examining the potential mediating roles of organizational commitment and psychological ownership. By doing so, it seeks to contribute to the broader discourse on leadership effectiveness in the digital age and provide insights that can help organizations navigate the challenges of the digital transformation (Chen et al., 2021; Lin et al., 2021). In summary, the rapid development of the digital economy necessitates a critical examination of leadership styles to ensure they are conducive to the new organizational realities. This research endeavors to shed light on the mechanisms through which leadership styles impact employee engagement in the digital economy, offering valuable perspectives for both academic inquiry and practical application.

Literature Reviews

Leadership Style and Employee Engagement

The concept of leadership style, encompassing the diverse behavioral patterns leaders employ to influence their teams, plays a pivotal role in shaping employee engagement within organizations (Thanomton et al., 2018). Historical evolutions in leadership theories, ranging from trait to contingency theories, have paved the way for contemporary focuses on transactional and transformational leadership styles (Bass, 1985; Avolio et al., 1999).

Transactional leadership, rooted in the principles of social exchange theory (Mitchell et al., 2012), operates on a quid-pro-quo basis, where leaders and subordinates engage in a mutual exchange of rewards for performance. This leadership style is characterized by clear role definitions and contingent rewards, fostering a structured and predictable work environment. Empirical studies, such as those by Avolio et al. (1999), highlight the positive impact of transactional leadership on employee engagement, suggesting that the clarity and rewards associated with this style can enhance organizational commitment and engagement levels. On the other hand, transformational leadership, as proposed by Avolio et al. (1999), seeks to inspire and motivate employees beyond immediate self-interests towards higher goals and

values. This style is delineated into four key dimensions: Idealized Influence, Inspirational Motivation, Intellectual Stimulation, and Individualized Consideration. Research by Wang et al. (2015) and Xu & Li (2019) corroborates the significant positive correlation between transformational leadership and employee engagement, indicating that this leadership style's focus on vision, support, and intellectual challenge can profoundly influence employee dedication and vitality.

The influence of leadership on employee engagement extends beyond the confines of traditional organizational settings, especially in the context of the digital economy, where the dynamism and fluidity of work necessitate adaptable and inspirational leadership approaches (Cloke & Goldsmith, 2002). The rapid advancements in digital technologies and changing organizational landscapes underscore the need for leaders who can navigate these complexities while fostering an environment conducive to high engagement levels (Srimata et al., 2019).

Furthermore, the interplay between leadership styles and employee engagement is nuanced by factors such as organizational support, communication, and individual employee attributes, including age, satisfaction, and sense of achievement (Ye & Liu, 2020). These elements highlight the multifaceted nature of engagement and the critical role leadership plays in orchestrating a work environment that promotes high levels of engagement. In light of the discussed literature, the hypothesis emerges as follows:

H1: Leadership style positively affects employee engagement

This hypothesis is grounded in the theoretical underpinnings of social exchange theory and the empirical evidence supporting the positive effects of both transactional and transformational leadership on employee engagement. As organizations navigate the complexities of the digital economy, understanding the nuances of how leadership styles influence engagement becomes increasingly imperative.

Leadership Style and Organizational Commitment

The interplay between leadership style and organizational commitment is a subject of significant interest within organizational behavior research. Studies have consistently demonstrated that both transactional and transformational leadership styles are instrumental in influencing the level of organizational commitment among employees, albeit through different mechanisms (Wu & Zhao, 2010; Cui et al., 2010).

Transactional leadership, characterized by its focus on clear transactions between leaders and subordinates, leverages rewards and performance standards to foster commitment. This leadership style, prevalent across various organizational types, is predicated on the social exchange theory, which posits that social interactions are essentially transactions aiming for mutual benefit (Mitchell et al., 2012; Bierstedt, 1965). Transactional leaders, by establishing explicit contracts and rewarding employees upon the achievement of set performance standards, cultivate a reciprocal relationship that bolsters organizational commitment (Lin et al., 2021).

In contrast, transformational leadership, with its emphasis on vision, inspiration, and individual consideration, engenders a deeper, more intrinsic form of commitment. Transformational leaders enhance organizational commitment by embodying the organizational values, setting inspirational examples, and fostering an environment that encourages innovative thinking and a strong sense of belonging among employees (Bono & Judge, 2003; Lowe & Vodanovich, 1995). Research employing structural equation models has further affirmed the significant impact of transformational leadership on not only organizational commitment but also on employees' innovation performance (Yang et al., 2009).

The differential impact of these leadership styles on organizational commitment can be attributed to their distinct approaches to influencing employee behavior and attitudes. While transactional leadership relies on external motivators such as rewards and recognition, transformational leadership seeks to internally motivate employees by aligning their personal

goals with the organizational vision and fostering a supportive and empowering work environment. Given the empirical evidence and theoretical underpinnings presented, the following hypothesis is proposed:

H2: Leadership style positively affects organizational commitment

This hypothesis is supported by the foundational principles of social exchange theory and a body of research highlighting the critical role of leadership behavior in fostering organizational commitment. Understanding the nuances of how different leadership styles impact organizational commitment is crucial for developing effective leadership strategies in diverse organizational contexts.

Leadership Style and Psychological Ownership

Leadership style plays a crucial role in fostering psychological ownership among employees, a concept which reflects their sense of possession and personal investment in their work and the organization. The intricate relationship between leadership and psychological ownership can be elucidated through several dimensions.

Firstly, leaders act as the organizational "agents," bridging the gap between the abstract entity of the organization and its employees (Konczak et al., 2000). This connection facilitates employees' understanding of organizational expectations, aiding in the development of their self-concept and identity. The direct and indirect communication from leaders profoundly influences employees' self-perception and their attitudes towards the organization (Lord & Brown, 2001).

Furthermore, the quality of the relationship between leaders and their subordinates, characterized by support, care, and problem-solving, significantly contributes to employees' sense of belonging. Additionally, leaders who create conducive working conditions, provide timely feedback, and foster harmonious interpersonal relationships within the organization, enhance employees' dependence on and belonging to the organization, thereby strengthening psychological ownership (Pierce et al., 2003). Transformational leadership, in particular, plays a pivotal role in satisfying employees' needs for a sense of "home," self-efficacy, and self-identity, which are essential for cultivating psychological ownership (Van Dyne & Pierce, 2004; Zhou & Long, 2011). Through personalized care, inspirational motivation, and intellectual stimulation, transformational leaders create an environment where employees feel valued, trusted, and safe, akin to the warmth of a "home." This nurturing atmosphere encourages employees to innovate and challenge themselves, enhancing their self-efficacy and aligning their personal goals with the organizational vision, thereby fostering a deep sense of psychological ownership.

Drawing from the theoretical insights of Pierce et al. (2003) and the empirical evidence provided by Liang & Li (2018), it is evident that leadership style, especially transformational leadership, is instrumental in developing psychological ownership among employees by meeting their intrinsic needs and creating a supportive organizational environment. Based on the foregoing discussion, the following hypothesis is proposed:

H3: Leadership style positively affects psychological ownership

This hypothesis underscores the significance of leadership in shaping the psychological ownership of employees, which is crucial for their engagement, commitment, and overall performance within the organization.

The Mediating Effect of Organizational Commitment

Organizational commitment plays a pivotal role in mediating the relationship between leadership style and employee engagement. This mediating effect is rooted in the premise that a deep sense of commitment to the organization enhances employees' willingness to engage fully in their work, thereby improving overall business performance.

In the context of Chinese culture, which places a high value on collective identity and harmony, Liang & Zhang (2017) argue that enhancing work engagement, emotional belonging, and

organizational identity are crucial for boosting employee engagement. This perspective underscores the significance of organizational commitment in bridging the gap between leadership influence and the level of employee engagement.

Further supporting this view, Zhuang & Qu (2012) in their analysis of employee engagement within small and medium-sized enterprises, found that most dimensions of organizational commitment, barring ideal commitment and trait engagement, exhibit a significant positive correlation with employee engagement. This finding suggests that various aspects of organizational commitment, such as affective, continuance, and normative commitment, are integral to fostering a highly engaged workforce.

Given the evidence and theoretical backing, it is posited that organizational commitment not only directly impacts employee engagement but also serves as a critical mediating factor that amplifies the influence of leadership styles on engagement levels. Therefore, leadership practices that enhance organizational commitment—by aligning individual and organizational goals, fostering a sense of belonging, and acknowledging employee contributions—are likely to see a more pronounced effect on employee engagement. Based on these insights, the following hypotheses are formulated:

H4: Organizational commitment positively affects employee engagement, acting as a fundamental driver of the engagement process.

H5: Organizational commitment mediates the relationship between leadership style and employee engagement, suggesting that the impact of leadership on engagement is, in part, channeled through the level of commitment employees feel towards their organization.

These hypotheses highlight the central role of organizational commitment in the dynamics of leadership influence and employee engagement, suggesting that efforts to enhance commitment are likely to yield substantial improvements in engagement levels and, by extension, organizational performance.

The Mediating Effect of Psychological Ownership

Psychological ownership, a construct pivotal to understanding employee engagement within organizations, encapsulates the sense of possession and personal investment individuals feel towards their work and the broader organizational context. As defined by Pierce et al. (2003), psychological ownership is the state in which an individual feels as though the target of ownership (e.g., a task, role, or the organization itself) is "theirs," fostering a profound psychological attachment and sense of responsibility towards it.

This sense of ownership is not limited to tangible assets but extends to various facets of the organizational environment, including roles, ideas, and the organizational identity itself. Scholars such as Li et al. (2018) and Zhang et al. (2012) have expanded on Pierce et al.'s foundational work, exploring the nuanced manifestations of psychological ownership, from organizational to brand ownership, each contributing uniquely to an individual's engagement and loyalty.

The formation of psychological ownership within individuals catalyzes a cascade of positive outcomes, including enhanced responsibility, initiative, and a stronger alignment of personal and organizational goals (He et al., 2017). This alignment is crucial for fostering an environment where employees are not only more engaged but also more committed to the organization's success, thereby bridging the gap between leadership influence and engagement. Moreover, the conceptualization of psychological ownership has broadened, encompassing collective and intellectual dimensions, which underscores the multifaceted nature of ownership within organizational settings (Kou et al., 2018; Zheng et al., 2017). Despite the richness of the construct, the measurement of psychological ownership within Chinese research has predominantly relied on adapted versions of established scales, reflecting the need for more localized measures (You et al., 2011; Chen et al., 2012).

Given the intricate relationship between psychological ownership, leadership style, and employee engagement, the following hypotheses are posited:

H6: Psychological ownership exerts a positive influence on employee engagement, signifying the critical role of personal investment and sense of ownership in driving engagement.

H7: Psychological ownership mediates the relationship between leadership style and employee engagement, suggesting that the way leaders foster a sense of ownership among employees significantly impacts their level of engagement.

These hypotheses highlight the importance of psychological ownership as a mediating factor that not only enhances the direct impact of leadership on engagement but also contributes to a more nuanced understanding of how employees' sense of ownership over their work and the organization influences their engagement levels. From the literature review, the conceptual framework is shown in Figure 1.

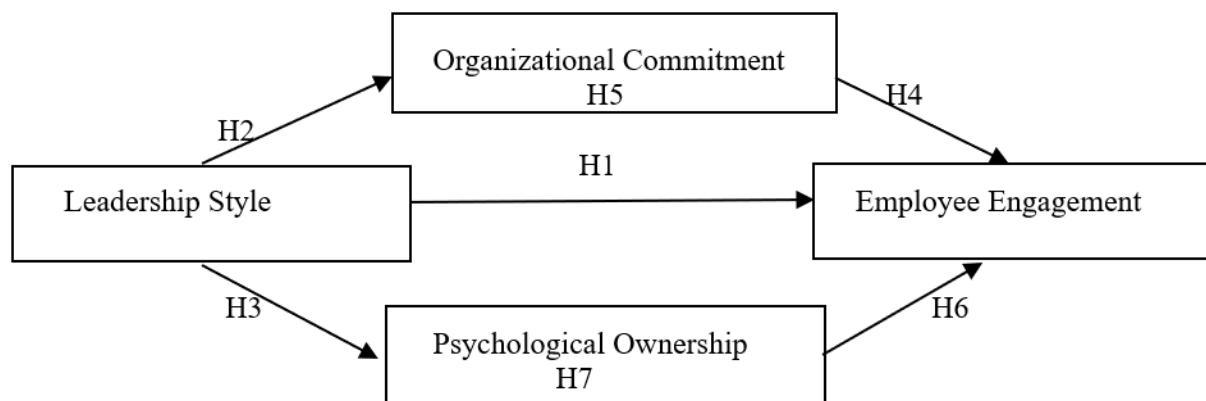


Figure 1 Conceptual Framework

Research Methodology

This investigation targeted employees from various enterprises within the Guangxi region of China. As indicated by the 2019 Statistical Bulletin on the Economic and Social Development of the Guangxi Zhuang Autonomous Region, the employment figure stood at 28.532 million by year-end, according to the population of permanent residents. In line with Structural Equation Modeling (SEM) sample size requirements, Bentler & Chou (1987) recommend a sample size minimum of five times the number of estimated parameters for models assuming normal distribution devoid of missing or extreme values. Alternatively, a more stringent criterion suggests a sample size fifteen times the number of parameters. Given that this study estimated 17 parameters, the selected sample size of 358 individuals surpasses the latter recommendation, ensuring statistical rigor.

The study employed a convenience sampling methodology, with data collection facilitated through an online questionnaire comprising five sections: Leadership Style, Employee Engagement, Organizational Commitment, Psychological Ownership, and Demographic Characteristics. The Leadership Style Scale, derived from Avolio & Bass (1995), incorporated three dimensions of transactional leadership and four dimensions of transformational leadership, yielding a Cronbach's alpha coefficient of 0.963. The Employee Engagement Scale, adapted from Gallup (2005), comprised four dimensions and reported a Cronbach's alpha coefficient of 0.937. The Organizational Commitment Scale, translated and adapted by Wang (2009), included three dimensions and achieved a Cronbach's alpha coefficient of 0.957. The Psychological Ownership Scale, modified from Avey's original by Chen et al. (2012), differentiated between facilitative and defensive psychological ownership within the Chinese cultural context, with the former entailing three dimensions and the latter four, resulting in a

Cronbach's alpha coefficient of 0.935. The scales' internal consistency, assessed via the IOC test, was recorded at 0.90.

Analytical procedures encompassed descriptive statistical analysis, structural equation modeling (SEM), and confirmatory factor analysis, complemented by a thorough assessment of fit indices. Should the initial model fit prove unsatisfactory, modifications were contemplated based on the modification indices to enhance the model's fidelity and robustness. Responses were elicited using a 5-point Likert scale, ranging from 1 ("Very inconsistent") to 5 ("Very consistent"), enabling a detailed evaluation of participants' responses across the study's various constructs.

Research Results

Demographic Profile of Respondents

Data were collected using an online survey tool, yielding a total of 371 responses from employees across various enterprises in Guangxi. Upon rigorous screening to eliminate incomplete or invalid responses, 358 questionnaires were deemed suitable for analysis. The demographic composition of the sample was as follows: 169 male respondents (47.21%) and 189 female respondents (52.79%). The age distribution indicated a predominance of participants between 26-35 years (180 individuals, 50.28%), succeeded by those aged 36-45 years (65 individuals, 18.16%), under 25 years (58 individuals, 16.20%), over 55 years (34 individuals, 9.50%), and 46-55 years (21 individuals, 5.87%). Educational attainment was varied, with a significant proportion holding specialist degrees (144 individuals, 40.22%) or undergraduate degrees (144 individuals, 40.22%), followed by high school diplomas (48 individuals, 13.41%), sub-high school qualifications (38 individuals, 10.61%), master's degrees (35 individuals, 9.78%), and doctoral degrees (11 individuals, 3.07%). In terms of tenure, the majority reported 1-5 years of service (116 individuals, 32.40%), with subsequent categories being 6-10 years (103 individuals, 28.77%), 11-20 years (69 individuals, 19.27%), less than 1 year (42 individuals, 11.73%), 21-30 years (21 individuals, 5.87%), and over 30 years (7 individuals, 1.96%).

Confirmatory Factor Analysis

This research employed confirmatory factor analysis (CFA) to evaluate the measurement model, which encompassed the Leadership Style Scale, Employee Engagement Scale, Organizational Commitment Scale, and Psychological Ownership Scale. The Leadership Style Scale was delineated into transactional and transformational leadership dimensions, with the former comprising Exception Management (EM), Laissez-faire Leadership (LL), and Contingent Reward (CR), and the latter including Idealized Influence (II), Inspirational Motivation (IM), Intellectual Stimulation (IS), and Individualized Consideration (IC). The Employee Engagement construct was segmented into Acquisition (AC), Dedication (DE), Belonging (BT), and Development (DM). The Organizational Commitment construct was divided into Value Commitment (VC), Effort Commitment (EC), and Retention Commitment (RC), whereas the Psychological Ownership construct consisted of Self-efficacy (SE), Responsibility (RE), Identity Attribution (IA), and Defense (DF).

Convergent validity, indicative of the internal consistency and stability of the constructs, was ascertained through CFA, conducted via AMOS software. The analysis yielded standardized regression coefficients (factor loadings) for all constructs exceeding the 0.5 threshold. Table 1 presents the Average Variance Extracted (AVE) and Composite Reliability (CR) indices for each construct, demonstrating that all AVE values surpassed 0.5 and all CR values exceeded 0.7, affirming the constructs' convergent validity.

Table 1 AVE and CR Indices of the Constructs

Factor	AVE	CR
Leadership Style	0.686	0.937
Employee Engagement	0.654	0.881
Organizational Commitment	0.808	0.927
Psychological Ownership	0.631	0.869

The overall fit of the measurement model was assessed through construct validity, examining the alignment between the empirical data and the theoretical model. Utilizing AMOS software for analysis, the model's fit indices post-adjustment are depicted in Table 2. The chi-square to degrees of freedom ratio (χ^2/df) was 2.96, below the threshold of 3. Indices such as the Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Tucker-Lewis Index (TLI), and Normed Fit Index (NFI) all exceeded the critical value of 0.9, and the Root Mean Square Error of Approximation (RMSEA) was 0.074, indicating an acceptable fit between the observed data and the hypothesized model.

Table 2 Fit Indices of the Confirmatory Factor Analysis

	χ^2/df	RMSEA	GFI	NFI	TLI	CFI
Standard value	<3	<0.08	>0.9	>0.9	>0.9	>0.9
Verification values	2.96	0.074	0.900	0.948	0.953	0.965

Discriminant validity, assessing the distinctiveness among the latent constructs, was evaluated using SPSSAU software. The analysis involved comparing the square root of AVE for each construct against the correlation coefficients between constructs. As illustrated in Table 3, Leadership Style exhibited adequate discriminant validity with an AVE square root (0.828) exceeding the highest inter-construct correlation coefficient (0.748). Conversely, Employee Engagement showed potential concerns regarding discriminant validity, with an AVE square root (0.808) lower than the highest inter-construct correlation coefficient (0.897). Both Organizational Commitment and Psychological Ownership demonstrated satisfactory discriminant validity, with AVE square roots (0.899 and 0.795, respectively) surpassing the highest inter-construct correlation coefficients (0.897 and 0.793).

Table 3 Pearson correlation and Ave Square root

	Leadership Style	Employee Engagement	Organizational Commitment	Psychological Ownership
Leadership Style	0.828			
Employee Engagement	0.748	0.808		
Organizational Commitment	0.701	0.897	0.899	
Psychological Ownership	0.702	0.793	0.735	0.795

Note: Diagonal bold values represent the square root of AVE for each construct, indicating discriminant validity.

Analysis of the Impact of Leadership Style on Employee Engagement

In the SEM analysis, the leadership style, encompassing three transactional and four transformational dimensions, was operationalized as a latent variable with its respective dimensions serving as observable variables. Similarly, the dimensions of employee engagement were treated as observable variables, with employee engagement itself conceptualized as a latent variable. The path coefficients and their corresponding significance levels are depicted in Figure 2 and detailed in Table 4.

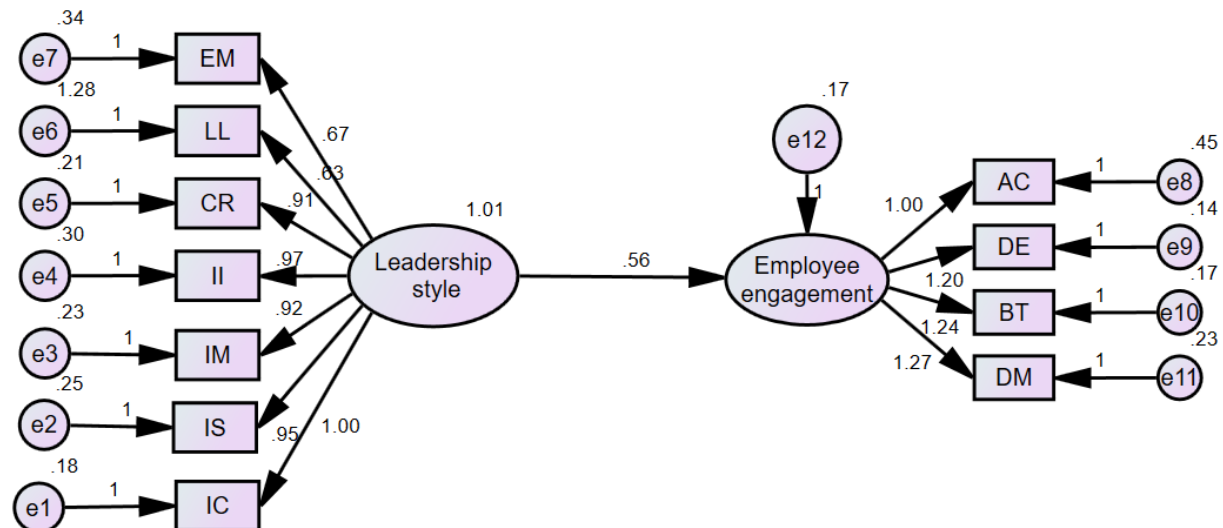


Figure 2 Path Coefficient Diagram

Table 4 Path Coefficient Values

Variables	β	b	S.E.	C.R.	P
H1: Leadership style \rightarrow Employee Engagement	0.80	0.56	0.04	14.126	***

Note: β represents the standardized estimate, b represents the unstandardized estimate, S.E. denotes standard error, and *** indicates a significance level of .001.

The analysis revealed a significant influence of leadership style on employee engagement ($\beta = 0.559$, S.E. = 0.04, C.R. = 14.126, $P < 0.001$), indicating a positive predictive relationship between perceived leadership style and employee engagement levels. The model's chi-square value was 116.384 with 41 degrees of freedom, yielding a χ^2/df ratio of 2.84. Fit indices including GFI, TLI, and CFI were all above 0.9, and the RMSEA value was 0.072 (< 0.08), suggesting a satisfactory model fit (Table 5).

Table 5 Fit Indices for Path Analysis

Fitting indicators	χ^2	df	χ^2/df	GFI	TLI	CFI	RMSEA
	116.384	41	2.84	0.944	0.972	0.979	0.072

Based on these findings, we accept Hypothesis 1.

Final Model Evaluation

The SEM further incorporated organizational commitment and psychological ownership as mediating variables between leadership style and employee engagement. Figure 3 and Table 6 present the path diagram and coefficient values, respectively.

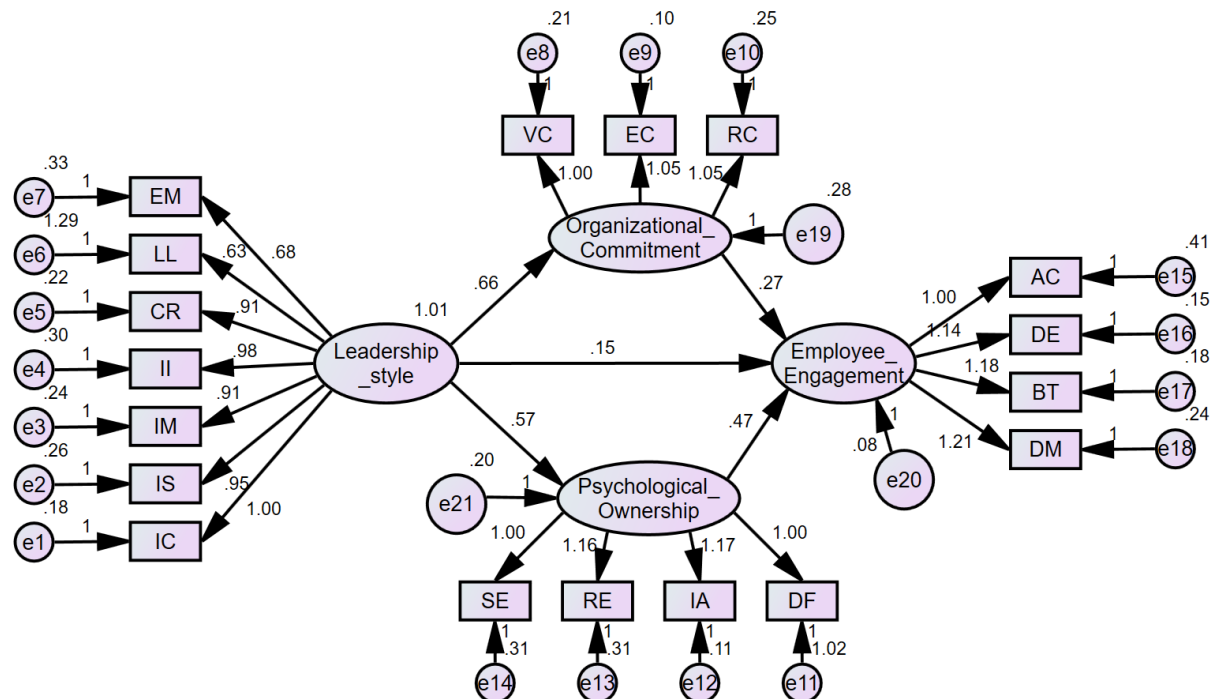


Figure 3 Path Coefficient Diagram for the Finalized Model

Table 6 Path Coefficient Values for the Finalized Model

Variables	β	b	S.E.	C.R.	P
H2: Leadership Style→Organizational Commitment	0.78	0.66	0.039	16.933	***
H3: Leadership Style→Psychological Ownership	0.79	0.57	0.052	10.97	***
H4: Organizational Commitment→Employee Engagement	0.32	0.27	0.043	6.275	***
H6: Psychological Ownership→Employee Engagement	0.49	0.47	0.065	7.284	***
H5: Leadership Style→Organizational Commitment→Employee Engagement	0.25				***
H7: Leadership Style→Psychological Ownership→Employee Engagement	0.39				***

Note: β refers to standardized estimate, b refers to unstandardized estimate, S.E. refers to standard error, *** = significant level as of .001

Leadership style exhibited a direct effect on employee engagement with a significant predictive coefficient ($b = 0.559$, $P < .001$). When organizational commitment and psychological ownership were controlled as mediators, leadership style's predictive effects on organizational commitment ($b = 0.658$, $P < .001$) and psychological ownership ($b = 0.572$, $P < .001$), as well as their effects on employee engagement ($b = 0.273$ and $b = 0.472$, respectively, $P < .001$), were significant. The predictive effect of leadership style on employee engagement was reduced ($b = 0.147$, $P < .002$) when mediators were included, indicating partial mediation by organizational commitment and psychological ownership.

Model fit indices after modification are reported in Table 7, with a chi-square value of 364.244, 105 degrees of freedom, and a χ^2/df ratio of 3.47. The NFI, TLI, and CFI indices exceeded 0.9, and the RMSEA was 0.083 (< 0.1), demonstrating an acceptable fit for the comprehensive SEM model.

Table 7 Fit Indices for the Finalized Model

Fitting indicators	χ^2	df	χ^2/df	GFI	TLI	CFI	RMSEA
	364.244	105	3.47	0.944	0.941	0.959	0.083

Accordingly, Hypotheses 2 through 7 are supported by the model outcomes.

Conclusion and Discussion

This investigation conducted a comprehensive analysis of employee engagement, organizational commitment, psychological ownership, and perceived leadership style within enterprises in Guangxi, China. By positioning leadership style as the antecedent variable and incorporating organizational commitment and psychological ownership as intermediary variables, this study elucidated the interplay among these constructs within the digital economy's framework.

Impact of Leadership Style on Employee Engagement

Our analysis confirms that leadership style significantly influences employee engagement, aligning with the theoretical underpinnings of Avolio & Bass (1995) and supported by empirical findings from Mitchell et al. (2012), Wang et al. (2015), and Xu & Li (2019). The structural equation model employed demonstrated robust fit, validating the selected dimensions of transactional and transformational leadership in relation to employee engagement as conceptualized by Gallup (2005). This study extends the discourse by empirically verifying that both transactional leaderships, through its emphasis on contingent rewards and exceptional management, and transformational leadership, characterized by vision motivation, intellectual stimulation, and personalized care (Avolio & Bass, 1995; Li et al., 2006), are pivotal in fostering employee engagement within the digital economy.

Mediating Role of Organizational Commitment and Psychological Ownership

Further, our findings highlight the mediating roles of organizational commitment and psychological ownership in the relationship between leadership style and employee engagement. This resonates with the assertions of Cui et al. (2010) and Lin et al. (2021) regarding the positive impact of leadership style on organizational commitment, which in turn enhances employee engagement (Zhuang & Qu, 2012). The study's structural equation modeling (SEM) corroborates that transactional leadership, by setting clear performance standards and rewarding achievements, and transformational leadership, by inspiring and caring for subordinates, significantly contribute to elevating organizational commitment and psychological ownership, thereby fostering a deeper sense of engagement among employees.

Limitations and Future Research Directions

Notwithstanding its contributions, this study is circumscribed by certain limitations. The focus on enterprises within Guangxi may restrict the generalizability of the findings, But the focus on transactional and transformational leadership styles provides a valuable framework for understanding the dynamics of employee engagement in a digital environment, which needs to be scaled up in the future, the interval-based random sampling survey was further verified. Moreover, the exploration of leadership styles was confined to transactional and transformational dimensions, omitting other potentially influential styles such as charismatic and visionary leadership. Future research endeavors could benefit from expanding the scope of leadership styles examined and exploring the moderating effects of digital economy characteristics on the leadership-engagement nexus.

Conclusion

In sum, this research underscores the pivotal role of leadership style in enhancing employee engagement, mediated by organizational commitment and psychological ownership, within the digital economy context. It offers valuable insights into the dynamic interplay among these constructs, providing a nuanced understanding of how leadership practices can be optimized to

foster engagement. Future studies are encouraged to extend this line of inquiry, exploring additional leadership styles and broadening the empirical base to enrich the academic discourse on leadership and employee engagement in the evolving digital landscape.

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