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RESEARCH ARTICLE

Navigating Leadership Dynamics: A Study of Innovative Work Behavior in Malaysian Organization

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ABSTRACT

Innovative work behaviour (IWB) is increasingly recognized as a crucial element for enhancing organizational performance in Malaysian workplaces, particularly in the public sector. This study explores how transformational leadership, transactional leadership, and psychological empowerment relate to innovative work behaviour (IWB) in Malaysian organisations. This study used a quantitative online questionnaire survey and distributed it to collect data from 280 employees in *Perbadanan Kemajuan Negeri Selangor* (PKNS). Partial Least Square – Structural Equation Modelling (PLS-SEM) statistical technique was employed to analyse the questionnaire survey data collected using Smart-PLS 3.0. The findings show that transformational leadership has significant impacts on IWB, however, there are negative effects for transactional leadership. Psychological empowerment, the interface between transformational and transactional leadership, plays a vital role in facilitating IWB. The study emphasises the significance of cultivating a culture of innovation in Malaysian businesses through the use of transformational leadership styles and the empowerment of employees. The results have significant effects on the enhancement of leadership skills and the formulation of organisational plans within the framework of Industry 4.0.

Contribution/Originality: The study contributes to theoretical knowledge by demonstrating the importance of leadership behavior and psychological empowerment as mechanisms that stimulate employees' IWB. It also confirms the principles of Social Cognitive Theory (SCT) in understanding human behavior within this context. Furthermore, the findings provide valuable practical information for PKNS to improve their management practices.

1. Introduction

In today's fast-paced and competitive corporate environment, innovative work behaviour (IWB) plays a crucial role in determining organisational success. To maintain a competitive edge and adjust to evolving market conditions, organisations must possess the capacity to produce and execute novel concepts, products, and processes. Nevertheless, the effectiveness of IWB is not exclusively determined by individual traits or abilities, but also by the organisational environment and leadership approaches. This study examines the relationship between transformational leadership, transactional leadership, and psychological empowerment on IWB in Malaysian organisation. The complexity of innovation in organisations has increased as a result of global economic shifts. Innovation encompasses the efficient generation and implementation of novel ideas, products, and methods (Lukes & Stephan, 2017). Promoting creativity among employees can have a good impact on organisational performance and lead to a long-lasting competitive advantage (Palazzeschi et al., 2018; Yuan & Woodman, 2010). The academic community is increasingly focusing on the notion of IWB due to its alignment with Industry 4.0 and the potential benefits it offers to individuals and companies (Ab Rahman & Ismail, 2018; Ab Rahman et al., 2018; Gu et al., 2017; Khaola & Coldwell, 2018). The term IWB has been coined and used by pioneers of psychological studies on innovation and innovation behaviour (Jong & Hartog, 2008; Janssen, 2000; Scott & Bruce, 1994; Taştan & Davoudi, 2015; West & Farr, 1990). However, some differences exist between the constructs (Scott & Bruce, 1994; West & Farr, 1989).

The impact of IWB on work outputs has been the subject of extensive empirical research, as demonstrated by Jong and Hartog (2007). However, there hasn't been much research done in South East Asia, especially in Malaysia; instead, it has mostly concentrated on European and Asian locations. Moreover, public sector organisations like hospitals, government buildings, and schools have not received as much attention from prior research as have private sector organisations like banks, manufacturing firms, and IT corporations. The seeming monopolistic character of public sector businesses, which usually struggle with debt and cost reduction, might be blamed for the lack of focus. Therefore, it is imperative to carry out a more comprehensive inquiry into the application of IWB in public sector enterprises. In order to improve job performance, whether at the group or organisational level, innovative working behaviours (IWB) are the deliberate development, introduction, and use of novel concepts inside a work role, group, or organisation (Lukes & Stephan, 2017). concept generation, concept promotion, idea realisation, and opportunity investigation are its four facets. IWB's influence has been carefully studied in relation to a variety of outcomes, such as worker productivity, organisational creativity, and competitive advantage. Previous research has identified a number of factors, such as psychological empowerment and leadership behaviour, that influence the use of IWB (Bos-Nehles & Veenendaal, 2019).

Leadership plays a crucial role in shaping employee behaviour and fostering creativity. Transformational leadership and transactional leadership are two significant leadership styles associated with IWB. Transformational leaders stimulate and encourage people to exhibit favourable work behaviours by challenging their roles and generating new thoughts (Afsar & Badir, 2016; Farid et al., 2017; W Wasono & Furinto, 2018). This leadership style emphasises inspiring and motivating employees to accomplish organisational objectives. It is characterised by charisma, inspirational motivation, intellectual stimulation, and individualised consideration (Bass, 1985). Transformational leaders can empower employees by granting autonomy, giving necessary resources, and

offering support, which in turn enhances IWB (Jong & Hartog, 2007). They assist employees in discovering distinctive chances for enhancing their knowledge and skills, hence enhancing their work performance. Empirical research has yielded inconclusive findings about the relationship between transformational leadership and individual work behaviour (IWB). Some studies have found positive relationships, while others have identified negative or non-existent relationships.

Conversely, transactional leadership emphasizes the process of exchange between leaders and followers in which the former gives rewards or punishments in response to the performance (Hansen & Pihl-Thingvad, 2019). It is distinguished by characteristics including contingent reward, management by exception, and laissez-faire leadership (Bass, 1985). Employees under transactional leaders are frequently micromanaged and controlled, which can inhibit IWB (Khalili, 2016). One essential element of IWB is psychological empowerment. It describes the sense of competence, control, and self-efficacy employees feel when they participate in decision-making and have the autonomy to make decisions (Spreitzer, 1995). The relationship between transactional leadership and IWB is ambiguous, as several studies indicate a detrimental influence while others find no significant relationship. Empowerment is another factor linked to IWB. Psychological empowerment refers to an individual's essential task motivation demonstrated through four specific cognitions: meaning, competence, self-determination, and impact (Young et al., 2020). It was shown that transformational leadership has a beneficial impact on psychological empowerment. This is because transformational leaders offer support, encouragement, and growth possibilities, which in turn increase employees' sense of empowerment. Psychological empowerment is positively related to IWB as it enhances employee motivation, creativity, and innovation (Dedahanov et al., 2019). Since there are different perspectives and opinions from the previous study, therefore there is a need for a study to enhance the knowledge regarding this matter. Thus, this study explores how transformational leadership, transactional leadership, and psychological empowerment relate to innovative work behaviour (IWB) in Malaysian organisation.

2. Research Methods

2.1. Research Paradigm

This study employed a quantitative online questionnaire survey and distributed it to collect data from 280 employees in *Perbadanan Kemajuan Negeri Selangor* (PKNS). The survey questionnaire comprised items related to transformational leadership, transactional leadership, psychological empowerment, and individual work behaviour (IWB). The semi-structured interviews were centred on the leaders' perspectives regarding the Interactive Whiteboard (IWB) and the factors that influence it. The study used a positivist research paradigm, which prioritises objectivity, the ability to apply findings to a wider population, and the use of quantitative tools. The research process commences with comprehending the research paradigm position and its associated ramifications. Philosophical matters are essential in establishing the study goals, ascertaining the necessary evidence, directing procedures, and improving critical thinking abilities.

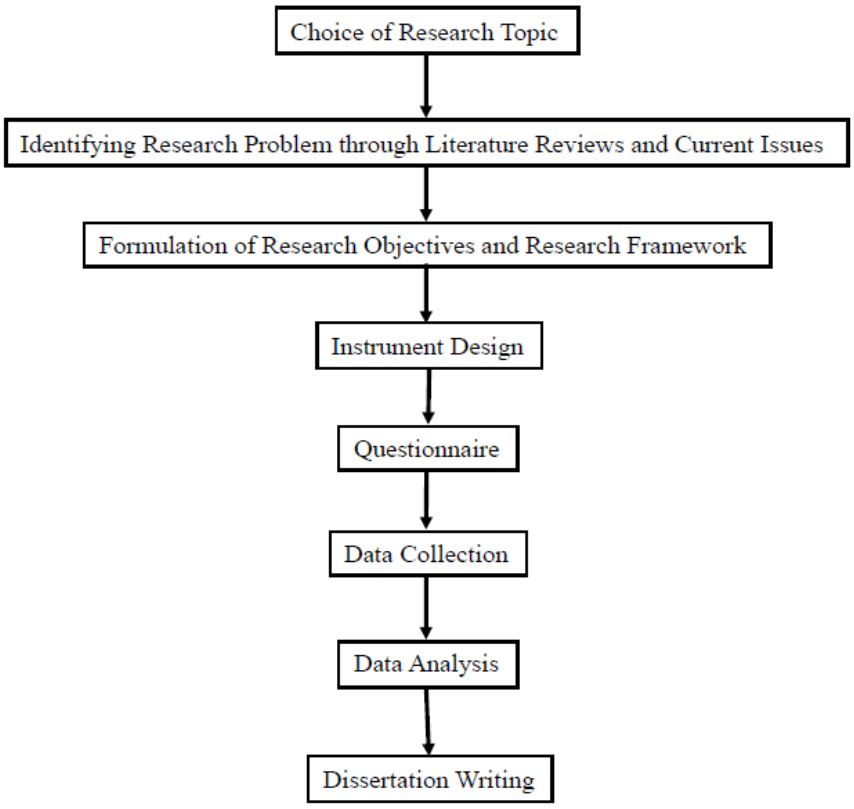
A research paradigm is a fundamental worldview that guides in research approach, determining areas of study, methods, and results. It is influenced by three basic assumptions: ontology, epistemology, and methodology. Ontology is a view of reality,

while epistemology assumes how knowledge can be procured and argued for. There are three main taxonomies of research paradigms in social research: positivist, interpretivist, and critical. The study uses deductive logic, hypotheses formulation, operational definitions, calculations, extrapolations, and expression to examine nature's relationship influences, focusing on positivism's quantitative method for generalization.

2.2. Research Design

The research design chosen is a descriptive study with a cross-sectional nature, aiming to collect data that describes the characteristics of the sample and to generalise the findings to a larger population. The study employs a quantitative methodology and utilizes a questionnaire as the main way of data gathering. The acquired data is subsequently evaluated utilizing statistical methods. The study examines the relationship between leadership behaviour (transformational and transactional leadership) and innovative work behaviour (IWB) and the mediating effect of psychological empowerment towards these relationships. The study setting is non-contrived and conducted in a natural environment with minimal researcher interference. The data collection was done in a natural setting where the researcher distributed the questionnaire only to the individuals who accepted the request to participate. The study's approach is motivated by the research philosophy of positivism, which focuses the use of scientific methods and the acquisition of knowledge that can be applied universally. Figure 1 depicts the comprehensive research design.

Figure 1: Research Design



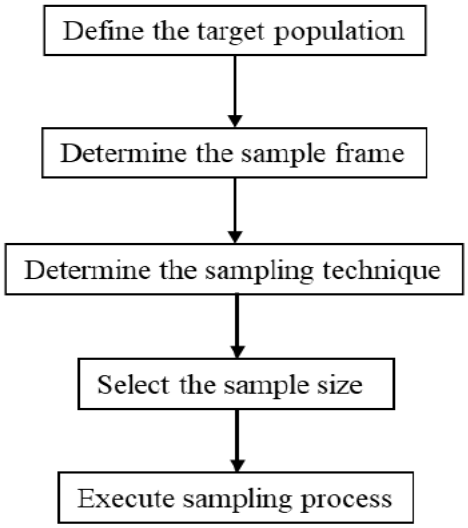
The study's design is well-suited for investigating the relationships between variables and testing hypotheses. It enables the collection of quantitative data and the use of statistical analyses to discover correlation and causal relationships. In general, the method

employed in the study is highly appropriate for the research aims and establishes a strong basis for the analysis and understanding of the data.

2.3. Sampling Design

The sampling design has multiple stages, which encompass defining the target population, establishing the sample frame, selecting a sampling technique (either probability or non-probability), deciding the sample size, and implementing the sampling process according to the desired design. Figure 2 depicts the sampling design.

Figure 2: Sampling Design



Source: Adopted from Zikmund et al. (2013)

2.4. Data Analysis Techniques

The study employed a quantitative methodology to evaluate the relationship between dependent and independent variables and examined the mediating influence. Data analysis began with data coding and data entry, assigning unique codes to questionnaire items to avoid confusion. Preliminary analysis was conducted using SPSS, and main analyses were performed using Smart-PLS 3 software. The process aimed to reduce data and make it meaningful and useful. The preliminary analysis addressed missing values, outliers, normality, and multicollinearity issues, which are crucial for data fit before the main analysis to ensure accurate findings. The study identified missing values using frequency and case summary tables. All responses were used for further analysis due to the online questionnaire design, which required compulsory answers. This process helped identify entry errors and missing values during data entry. Outliers are extreme responses within a set of variables that could falsify results.

Univariate and multivariate outliers are the two categories into which they fall. The Mahalanobis distance (X2) and the standard score (z score) are common statistical methods for assessing univariate outliers. With cautious threshold levels advised at a significance of 0.01 for the Mahalabonis distance, which calculates each observation's distance from the mean centre. A probability function called the normal distribution is essential for statistical investigations as it explains the values of variables. In order to prevent standard errors from being inflated, it is imperative to make sure the data is not

overly aberrant. Histograms and a normal Q-Q plot are two graphical techniques and statistical techniques (Kurtosis and skewness) that can be used to evaluate normality. Kurtosis gauges how peaked the distribution is, whereas skewness gauges symmetry. Values are deemed abnormal if the skewness and kurtosis are normal. Then, a multicollinearity test was done to measure high intercorrelations between independent variables using the Tolerance and Variance Inflation Factor (VIF). Tolerance, calculated using 1-R squared, explains the variance of an indicator not explained by other indicators. VIF, calculated using 1 divided by Tolerance, indicates multicollinearity. VIF values above 10 indicate multicollinearity, while 5 and higher indicate potential issues. The study follows Hair et al. (2017) guidelines.

Next, descriptive statistics organize and summarize data from a population sample using charts, graphs, and tables. Two types of descriptive measures are measure of central tendency and measure of dispersion. Measures of central tendency include mean, median, and mode. Measure of dispersion measures the variation in the data set, with range, variance, and standard deviation being the three main measurements. The study uses a measure of dispersion to provide an exact distance from the mean. The proposed framework was evaluated using Structural Equation Modelling (SEM), which offers advantages such as simultaneous testing of multiple regressions, examination of complex relationships, and individual parameter estimate tests. First-generation techniques, such as cluster analysis and exploratory factor analysis, have been replaced by second-generation techniques due to their limitations. These techniques can examine multiple relationships at once, allowing for the evaluation of latent variables and testing their relationships. Two types of statistical modeling techniques used are covariance-based SEM (CB-SEM) and partial least squares (PLS-SEM). CB-SEM confirms existing theories, while PLS-SEM predicts key target constructs and operates like a multiple regression analysis. PLS-SEM is suitable for estimating models using formative indicators, as it is less stringent with non-normal data and can handle smaller sample sizes.

3. Results

Table 1 summarises the overall findings of the questionnaire through the results of hypotheses testing based on the research objectives. The survey findings revealed that transformational leadership had a substantial and favourable influence on IWB, while transactional leadership had an adverse impact. Psychological empowerment was identified as a crucial intermediary factor linking transformational leadership and individual work behaviour (IWB). This study investigates the correlation between leadership styles, namely transformational and transactional leadership, and the influence of psychological empowerment on interpersonal work behaviour (IWB). The research aims to investigate whether there is a mediating effect of psychological empowerment on the connection, as well as to explore the potential link between transformational leadership and transactional leadership. The results are conveyed via descriptive analysis and statistical testing, providing a full knowledge of the correlation between leadership and IWB. Table 2 depicts the summary of the response rate.

Table 1: Overview of Findings

Objective		Hypotheses	Outcome
Objective 1: To examine the relationship between leadership behaviour	H1	Transformational leadership has a positive relationship with IWB.	Supported

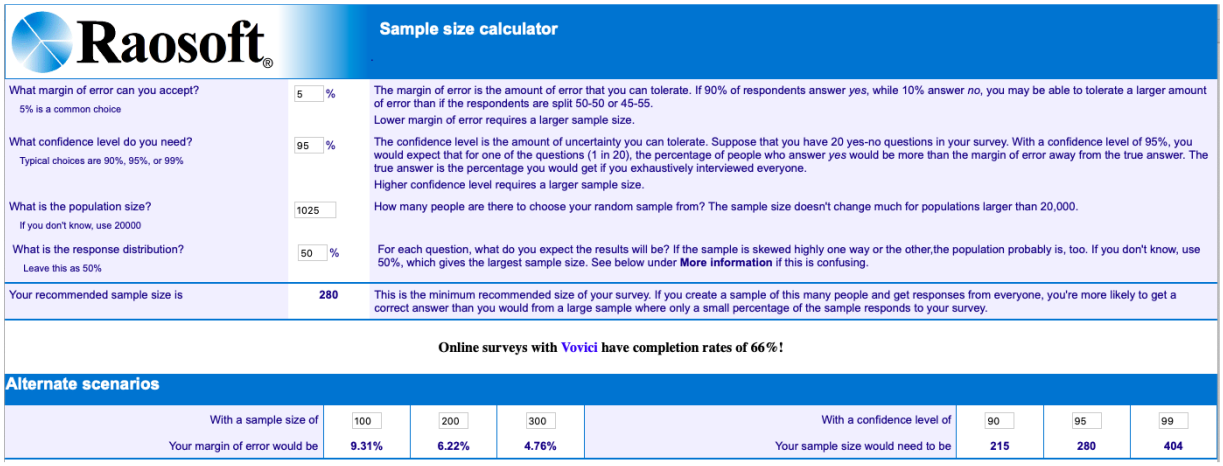
(transformational leadership and transactional leadership) and IWB.	H2	Transactional leadership has a negative relationship with IWB.	Not Supported
Objective 2: To uncover the relationship between leadership behaviour (transformational leadership and transactional leadership) and psychological empowerment.	H3	Transformational leadership has a positive relationship with psychological empowerment.	Supported
	H4	Transactional leadership has a negative relationship with psychological empowerment.	Not Supported
Objective 3: To determine the relationship between psychological empowerment and IWB.	H5	Psychological empowerment has a positive relationship with IWB.	Supported
Objective 4: To investigate the mediating effect of psychological empowerment between leadership behaviour (transformational leadership and transactional leadership) towards IWB.	H6a	Psychological empowerment mediates the relationship between transformational leadership and IWB.	Supported (Partial Mediation)
	H6b	Psychological empowerment mediates the relationship between transactional leadership and IWB	Not Supported (No Mediation)

Table 2: Summary of Response Rate

	Distributed	Returned	Rejected	Accepted	Percentage
Online-Questionnaire Suervey	280	219	7	212	76%

The questionnaire survey yielded a total response of 212 respondents, with a response rate of 76%, indicating a high level of participation from the total population of 1,025. Based on the previous study by Mellahi and Haris (2016), a response rate of above 50% is considered acceptable for human resource management research. Figure 3 shows the sample size calculation using Raosoft. The study implements a systematic random sampling technique, where every *n*th of the element in the population is randomly chosen among the elements between 1 and *n* (Sekaran & Bougie, 2016). In other words, the initial sampling point is selected at random and the selection is continued at regular intervals. This is to ensure that the samples selected are able to attain accuracy and reflect the population. The researcher conducted the sampling technique using a Microsoft Excel Worksheet. The researcher had chosen number 1 as the initial number of samples. Next, the total number of populations was divided by sample size to get the interval number. The interval number is 3.63 (1,025/280). Then, the interval number was added to the initial number, to get the second sample. The second number is 5 (3.63+1), by rounding the number to get an integer. This process was repeated subsequently until it reached the total sample size, which is 280.

Figure 3: Sample Size Calculation



The online questionnaire survey data was entered into the Statistical Package for Social Science (SPSS), ensuring accuracy and detecting errors. Data screening was performed to check for errors and correct them. The study used the case summaries function to handle any errors. The study analyzed the demographics of respondents, revealing a majority aged between 26-35 years, with a fair distribution of male and female respondents. The majority were Malays, with 98.1% being from that race. Marital status was predominantly married (76.4%), with only a small percentage being divorced (2.4%). Education level was predominantly bachelor's (42.9%), with diploma holders (37.3%) following. Most respondents held administrative assistant positions (38.2%), followed by executive officers (31.1%), senior officers (12.7%), and admin assistants (6.1%). They were mainly from the technical department (28.3%), followed by human resources, legal, and property management. Most respondents had been in the same department for less than 5 years (50.0%), with the largest group having been attached for 5 to 10 years (34.4%). Job tenure at PKNS was also high, with the majority having 5 to 10 years of experience.

Preliminary analysis addressed missing values, outliers, normality, and multicollinearity issues, ensuring data quality and fit for further analysis, as insufficient analysis may misrepresent findings. The study used the Mahalabonis distance, as Tabachnick and Fidell (2013) suggested, to assess outliers. The critical value of chi-squares for three independent variables was 16.27, and the Mahalabonis distance was within the guideline range, indicating no outliers in the data set. The Skewness and Kurtosis values for the present study are within the range of +1 to -1, indicating normal distribution. The Skewness values for IWB, transformational leadership, transactional leadership, and psychological empowerment are within the normal range.

The study used the variance inflator factor (VIF) to assess multicollinearity issues in a structural model. The inner VIF values for psychological empowerment, transactional leadership, and transformational leadership were less than 5, indicating that multicollinearity issues are not a concern. Table 3 shows the results of the multicollinearity test.

Table 3: Multicollinearity Test

	IWB	Psychological Empowerment
Psychological Empowerment	1.217	
Transactional Leadership	4.094	4.076

Transformational Leadership	4.195	4.076

Descriptive analysis describes respondents' characteristics and tests assumptions in statistical techniques. The study focuses on variables such as Innovation, Transformational Leadership, Transactional Leadership, and Psychological Empowerment. The mean score for Innovation was 4.086, indicating discretionary behaviour towards innovation. Transformational Leadership and Transactional Leadership scores were 3.779 and 3.750, respectively, indicating some perception of supervisor behaviour. Psychological Empowerment scores were 5.845, indicating empowerment by supervisors in carrying out work roles. Correlational analysis showed significant relationships between transformational leadership, transactional leadership, psychological empowerment, and IWB. The results showed that all variables acted as expected regarding direction and significance level. Table 4 illustrates the descriptive statistics for each variable used.

Table 4: Descriptive statistics for variables

Variables	Mean	S.D.	1	2	3	4
1. Innovative Work Behaviour	4.086	0.914				
2. Transformational Leadership	3.779	0.654	.556**			
3. Transactional Leadership	3.750	0.600	.340**	.750**		
4. Psychological Empowerment	5.845	0.762	.423**	.349**	.278**	

Note: N=212, S.D.= Standard Deviation **= $p < 0.01$

The study utilized the PLS-SEM model for statistical analysis due to its complexity and involving numerous variables. The model consists of two sub-models: the measurement model, which measures the relationship between latent variables and indicators, and the structural model, which measures the path between constructs. The study used PLS-SEM to assess the measurement model, focusing on internal consistency reliability, convergent validity, and discriminant validity, using Smart-PLS 3.0 software for detailed evaluation. The IWB had a composite reliability of 0.957, indicating sufficient reliability. The Hierarchical Component Models (HCM) had a composite reliability of 0.903 to 0.976, fulfilling the satisfactory guidelines of > 0.70. However, the Higher-Order Components (HOCs) for transformational leadership, transactional leadership, and psychological empowerment were manually calculated.

The composite reliability of transformational leadership was 0.965, transactional leadership was 0.763, and psychological empowerment was 0.903 (α =0.857). All constructs met the reliability requirement for further analyses, indicating satisfactory guidelines of > 0.70. Hair et al. (2017) used composite reliability and Cronbach's alpha to assess internal consistency reliability in leadership styles. The IWB had a composite reliability of 0.957, indicating sufficient reliability. The HCM had a composite reliability of 0.903 to 0.976, fulfilling the satisfactory guidelines of > 0.70. However, the HOCs for transformational leadership, transactional leadership, and psychological empowerment were manually calculated.

Convergent validity is a measure of the reliability of a construct. The minimum threshold for cross-loadings is 0.708, and if the indicator load is lower than 0.708, it should be deleted one by one until the AVE value of 0.50 is achieved. If the loading value is negative, the indicators should be deleted. If the AVE value is 0.5, low indicator values can be retained. The AVE of the IWB was 0.692, confirming convergent validity. The AVE of the HOC was calculated as the mean of the HOC squared loadings for the relationships

between the LOCs and HOC. The transformational leadership LOCs values were between 0.569 and 0.896, indicating convergent validity. The transactional leadership LOCs values were between 0.011 and 0.877, indicating convergent validity. The psychological empowerment LOCs values were between 0.546 and 0.845, indicating convergent validity.

In summary, all HOCs AVE constructs achieved acceptable convergent validity and met the requirements for further analysis. The study assessed the discriminant validity of the path model by analyzing indicators that load more on their constructs than on other constructs. The square root of AVE was larger than the correlation of all constructs, confirming satisfactory discriminant validity. The HTMT technique was used to measure discriminant validity, confirming that confidence intervals did not include 1. The study also assessed discriminant validity using cross-loadings of all constructs, finding that indicators load higher on their constructs and lower on other constructs. The outer loadings of the items were above 0.70, indicating reliability. Items with outer loadings below 0.7 were retained due to their contribution to convergent validity.

The study uses structural model analysis to analyze PLS-SEM in SmartPLS 3.0 comprehensively. It examines the relationship between transformational leadership, transactional leadership, and psychological empowerment toward Individual Work Behaviour (IWB). The study also hypothesizes the mediating effect of psychological empowerment on the relationship between transformational leadership, transactional leadership, and IWB. The structural model analysis examined path coefficients, representing hypothesized relationships between constructs. Standard values range from -1 to +1, with values close to +1 indicating strong positive relationships and -1 indicating negative ones. A standard error was obtained using bootstrapping, and most paths were statistically significant. The study's coefficient of determination (R2) showed that IWB (R2 = 0.374) and psychological empowerment (R2 = 0.131) had substantial levels of predictive accuracy, indicating that the model explained endogenous constructs well with fewer exogenous variables. The acceptable values for R2 range from 0.26 to 0.02, indicating substantial, moderate, and weak levels of predictive accuracy. Table 5 shows the coefficient of determination.

Table 5: Coefficient of Determination (R^2)

Endogenous Constructs	R^2
IWB	0.374
Psychological Empowerment	0.131

The study used Cohen's guideline to assess effect sizes (f^2), finding that transformational leadership had a medium effect on psychological empowerment. Transactional leadership had a small effect on IWB, while psychological empowerment had a small impact on IWB. The study used Stone-Geisser's predictive relevance (Q^2) to assess predictive relevance using blindfolding. Two approaches were used: cross-validated community and cross-validated redundancy. The cross-validated redundancy method included both the path and measurement models, predicting eliminated data points. The Q^2 values for IWB and psychological empowerment were above zero, indicating structural model predictive relevance. The PLS-SEM routine emphasizes predictive analysis in path model assessment, but recent research suggests using the PLS prediction procedure to examine the endogenous construct of the path model. The $Q^2_{predict}$ statistic is compared with the PLS-SEM-based prediction against a naïve benchmark. The $Q^2_{predict}$ value is positive,

indicating appropriate predictive power, and the linear regression model value is compared with the PLS-SEM-based value. The present study's $Q^2_{predict}$ values are positive, indicating appropriate predictive power. Table 6 shows the PLS Predict Assessment of Endogenous Constructs.

Table 6: PLS Predict Assessment of Endogenous Constructs

	RMSE	MAE	Q^2predict
IWB	0.847	0.668	0.298
PE	0.955	0.756	0.106

Note: IWB=Innovative Work Behaviour and PE=Psychological Empowerment

Table 6 presents the results of the PLS predict assessment of endogenous constructs' indicators, comparing linear regression model (LM) values and PLS-SEM-based values. The PLS-SEM analysis yields lower prediction error for all indicators, indicating high predictive power. The study's PLS predict path model supports predictive power for new cases of IWB and psychological empowerment, allowing for high predictive power and potential generalization to other samples.

4. Conclusion

The findings of this study highlight the importance of transformational leadership in fostering IWB in Malaysian organisations. Transformational leaders can empower employees by providing autonomy, resources, and support, which in turn enhances IWB. On the other hand, transactional leaders tend to micromanage and control employees, which can stifle IWB. Psychological empowerment is critical in facilitating IWB by enhancing employee motivation, creativity, and innovation. This study contributes to the existing body of knowledge on IWB by examining the relationship between transformational leadership, transactional leadership, and psychological empowerment in Malaysian organisations. The findings have implications for leadership development and organisational strategy in the context of Industry 4.0. Organisations seeking to foster a culture of innovation should adopt transformational leadership styles and empower employees to enhance IWB. Future studies should continue to explore the complex relationships between leadership styles, psychological empowerment, and IWB to provide a more comprehensive understanding of the factors that influence IWB.

Ethics Approval and Consent to Participate

The researchers used the research ethics provided by the Research Ethics Committee of Universiti Teknologi MARA (UiTM). All procedures performed in this study involving human participants were conducted following the ethical standards of the institutional research committee. The validity of this ethics approval is from 3rd March 2020 until 31st March 2020.

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Conflict of Interest

The authors reported no conflicts of interest for this work and declare that there is no potential conflict of interest with respect to the research, authorship, or publication of this article.

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