# Examining the Nexus of Transformational Leadership, Intellectual Capital, and Innovation: Implications for Organizational Performance

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*Abstract:* - This paper aims to provide insights into the intricate relationship between transformational leadership, intellectual capital (IC), innovation, and organizational performance directed towards Indonesia's state universities. The analysis in the study is based on survey data collected from 105 respondents (students) across 21 universities and employs elaborate advanced SmartPLS-SEM(v3.0). While the article showed no significant relationship between transformational leadership and innovation, a positive link was established from studies on transformational leaders to organizational performance. A sad research also shows how intellectual capital correlates with management results and support for innovation by presenting its advantages. Furthermore, it shows that innovation has a positive effect on organizational performance highlighting its transformational leadership. Cite this research provides insights for those of you who may interact in the Indonesian public university context and more broadly on leadership, intellectual capital, innovation, and performance dynamics.

*Key-Words:* - Higher Education, Intellectual Capital, Innovation, Organizational Performance, Public Universities, Sustainable Development, Transformational Leadership.

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## 1 Introduction

Assessing organizational performance highlights an organization's ability to meet stakeholder needs, thrive in its environment, and achieve its goals through the contributions of its members, [1]. Evaluating higher education institutions is vital given the competitive landscape and the importance of efficiency, cost management, and productivity, [2]. To gauge organizational effectiveness, one must assess outputs such as vision, goals, and overall development standards, [3]. Performance metrics are crucial in this context. Traditional methods prove particularly beneficial for economic evaluations within educational institutions when these metrics are applied, [4]. A simplified conceptual model portrays a university as a mechanism for converting inputs into outputs, positioning it as an integral component of broader economic and societal processes, [5].

Innovation also has the potential to generate economic value for organizations, [6]. Previous scholar describes innovation as the creation of new opportunities for added value, [7]. Organizational innovation is crucial for achieving better performance, [8], [9]. Numerous studies have been conducted in recent years on the relationship between organizational innovation and organizational performance, [10]. For every organization, innovation is considered a key to achieving sustainable success and economic growth, [11].

Leadership and leadership behavior are the most important factors in promoting innovation capability, [11]. Transformational leadership was first introduced by [12] to describe the ideal situation between political leaders and their followers. Transformational leadership is considered one of the most influential predictors that directly and indirectly affect innovation capability, [13].

Organizational performance places intellectual capital as one of the most crucial resources, [14]. As seen in many relevant studies in the past, the concept of intellectual capital is considered an unseen yet valuable asset, and the most powerful competitive weapon influencing innovation performance, [15]. Intellectual capital is regarded as

a crucial resource for the organization's performance and its capacity to innovate.

Universities, as organizations, face various challenges arising from global competition, rapid changes in educational technology, and increased pressure related to cost control and financing, [16]. Indonesian state universities also face significant lag when compared to state universities worldwide. For example, Universitas Indonesia, while ranking 1st nationally, stands at 533 out of 14,131 globally and 89th out of 5,830 universities in Asia according to the 2023 EduRank survey. This ranking evaluates research output, non-academic reputation, and the impact of prominent alumni, all of which serve as indicators of global excellence. Universitas Indonesia is ranked 273rd out of 1498 universities surveyed globally in 2024, according to the QS World University Rankings survey. Within the last twelve years, the survey data has demonstrated fluctuations in trends. In 2016, Universitas Indonesia experienced a substantial decline, as it was ranked 358th.

Indonesian state universities are significantly challenged in meeting international standards of excellence due to the gap between national and global rankings. This issue is not limited to Universitas Indonesia but extends to all state universities in the country. The need to achieve higher global rankings becomes increasingly urgent amidst the global competition in higher education.

To overcome this hurdle, it requires an all-inclusive approach aimed at increasing organizational performance. Through positive organizational transformation, Indonesian state universities can lay the groundwork for better global ranking performance and hence competitiveness to strengthen Indonesia's international position in higher education. An organization achieves its goals and objectives through optimal access to resources that it manages towards the achievement of the agency [17], which is denoted as organizational performance. Therefore, it is essential to identify and prioritize the factors crucial for enhancing organizational performance.

# 2 Theoretical Framework and Hypotheses

## 2.1 The Effect of Transformational Leadership on Innovation

Transformational leadership and innovation not only feed each other, but the interplay between the two is usually dynamic in nature, with the contingent details changing the entire scenario of this relationship being examined exhaustively in empirical research. For instance, previous research examined transformational leadership, showing a clear link between leadership and innovation, [18]. Their results show that superior transformational leadership types are associated with high organizational quality of innovation. Similarly, research by [19] provided support for the notion that transformational leadership facilitates the emergence of an innovative work culture. Research by these scholars demonstrates that the presence of transformational leaders significantly increases beneficial outcomes and translates to an accelerator within the context of innovation. Correspondingly, previous research shows thatthe effect of transformational leadership on innovation within organizational surroundings, [20]. The results, consistent with prior studies, supported that transformational leadership has a significant and positive impact on the innovation process. Jointly, these studies reveal that transformational leadership plays a crucial part in developing a climate for innovation in organizational settings.

*Hypothesis 1 (H1): Transformational Leadership has a positive relationship with Innovation.*

## 2.2 The Effect of Transformational Leadership on Organizational Performance

Numerous academic studies have examined the relationship between organizational performance and transformational leadership. Previous research by [21] investigated the impact of transformational leadership on organizational performance, revealing a notable correlation between these variables. Their results highlight that enhancing transformational leadership among administrative personnel significantly boosts organizational performance in Jordanian universities.

Similarly, research by [22] provided substantial evidence that transformational leadership positively influences organizational performance. Their research highlights the critical role of transformational leadership in determining organizational performance outcomes, advocating for the integration of transformational leadership characteristics into organizational contexts.

Previous research by [23] conducted research in Bangladesh that corroborates these findings, validating the beneficial impact of transformational leadership on organizational performance. Their study emphasizes the potential of well-executed transformational leadership practices to enhance organizational performance measures.

Further research by [24] also investigated the relationship between organizational performance and transformational leadership, with findings consistent with previous studies. They demonstrated a substantial and advantageous correlation between these variables. Collectively, these studies emphasize the importance of transformational leadership in enhancing organizational performance, advocating for the development of transformational leadership qualities within organizations.

*Hypothesis 2 (H2): Transformational Leadership has a positive relationship with Organizational Performance*

## 2.3 The Effect of Intellectual Capital on Innovation

The complicated relationship between intellectual capital and innovation has been investigated in a plethora of academic studies. For example, Previous research examined this effect and presented conclusive data in favor of it, [25]. This work emphasizes the importance of intellectual capital in promoting innovation within and across firms. [26], elaborated on this context by discussing the impact of intellectual capital on innovation outcomes. They draw attention to the role of human capital as a key innovation engine that should be invested strategically, underscoring the importance of intellectual capital to the organization.

Similarly, [27], investigated the impact of intellectual capital on the process of innovation. Their findings, consistent with earlier research, conclude that intellectual capital exerts a significant and positive effect on innovation. Collectively, these studies highlight the need for stimulating innovative initiatives by building intellectual capital in organizations. The common denominator in the lessons learned points to the idea that an organization possessing strong intellectual capital is more successful in creating a climate of innovation. Creativity, innovation, and problem-solving are all results of effectively leveraging intellectual capital. The results emphasize the strategic significance of investing in intellectual capital to drive innovation across organizations.

*Hypothesis 3 (H3): Intellectual Capital has a positive relationship with Innovation*

## 2.4 The Effect of Intellectual Capital on Organizational Performance

There are a vast number of scientific inquiries that have been made to examine the correlation between intellectual capital and the performance of the organization. Similarly, research by [28] reported a significant positive association between intellectual capital and performance, measuring how much intellectual capital is impacting the performance of organizational metrics.

In a similar vein, previous research by [29], in relation to the context of Ecuadorian universities, gave strong proof that intellectual capital had a very large and positive effect on performance. These results emphasize that intellectual capital has the potential to be an agent of change in influencing organizational outcomes. Intellectual capital has a positive impact on performance metrics [30], thereby providing evidence supporting our findings.

Furthermore, an empirical study also highlights the strong and positive association between intellectual capital and organizational performance which confirms initial results, [31]. Collectively, the findings from this study highlight intellectual capital as an important point of departure to enhance organizational performance. The utilization of human intellectual capital allows the tapping and nurturing of innovation channels besides enhancing operational efficiencies that give rise to competitive edges. This research highlights the need for organizations to invest in and retain intellectual capital as a key driver of success.

*Hypothesis 4 (H4): Intellectual Capital has a positive relationship with Organizational Performance*

## 2.5 The Effect of Innovation on Organizational Performance

Similarly, we have a robust body of work exploring the relationship between innovation and organizational performance. Similarly, the study by [32] shows that innovation is a major and significant predictor of organizational performance thus calling for strategies to enhance organizational effectiveness through innovation. Similarly, previous research by [33] discovered that innovation directly contributes to organizational performance, implying that institutionalizing a climate for innovation can produce significant advancements in several performance criteria. Following this, research by [34] found that innovation has a significant positive effect on organizational performance using empirical research.

The constellation of findings suggests that fostering an innovative culture within organizations is more of a strategic imperative. Organizations that promote expansive, out-of-the-box thinking will gain competitive advantages that can deliver growth, efficiency, and improved outcomes. These studies underscore the imperative of ensuring

innovation as a core source of organizational success.

*Hypothesis 5 (H5): Innovation has a positive relationship with Organizational Performance*

The conceptual model is built based on the hypotheses developed from the existing literature mentioned above. The model is presented in Figure 1.

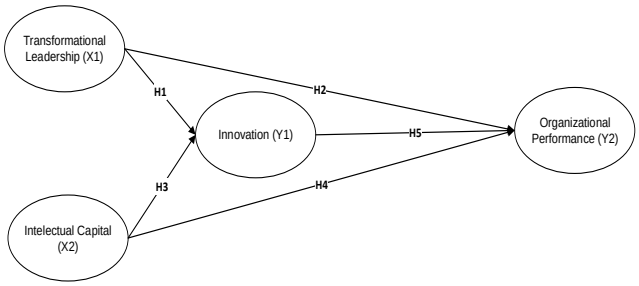


Fig. 1: Conceptual Model

# 3 Methodology

## 3.1 Statistical Analysis Techniques

Using a quantitative methodology, this study investigates the interrelation of transformational leadership, intellectual capital, innovation, and organizational performance in Indonesian public universities. The approach relies on primary data collected through highly intense surveys refined to extract essential feedback from public university stakeholders. The answers are then analyzed in-depth using SmartPLS 3.0 software and Structural Equation Modeling (SEM) to model the relevant relationships between dependent and independent variables. SEM, a powerful statistic, allows for studying how all of these variables interact and influence organizational performance. PLS-SEM was chosen because of its proven potential in modeling elaborate research models with a high number of data facets and variables, a frequently observed trait in business management research, [35].

Furthermore, the PLS-SEM is well suited for resolving the intricate dynamics between transformational leadership and firm performance, particularly considering that this research is performed with leadership teams in public organizations, [35]. Guided by methodological rigor and analytical precision, the research offers substantial contributions pertaining to the crucial roles of transformational leadership, intellectual capital, and innovation in public universities in Indonesia. To contribute to the state of knowledge in this area, our research seeks to provide practical guidance on how organizations might seek to drive impact and stimulate sustainability within higher education via the effective collection, consolidation, and interpretation of data.

## 3.2 Data Collection

A survey, incorporating measures of high-quality published scientific articles, was designed to test interactions between variables as proposed in the research model. The participants required in this research consisted of five leaders from a total of 21 state universities in Indonesia, bringing the total number of participants to 105 people. The questionnaire includes items measuring latent variable scales and demographic characteristics of the respondents. Indicators used to gauge the constructs proposed in this study have been specifically reviewed in existing literature and verified as valid and reliable measures. The questionnaire was then distributed to the intended respondents through Google Forms. We consider online surveys as the most appropriate method for data collection at this time.

## 3.3 Variable Metrics and Measurements

To measure the latent variables proposed in the literature review, the proposed instruments were adopted from previous studies, and each item was measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The following are the indicators used to measure the latent variables in this study (Table 1).

Table 1. Variable Metrics and Measurements

| Variable | Indicator | Source |
|---|---|---|
| Transformational Leadership (X1) | Idealized Influence (X1.1) | [21] |
| | Inspirational Motivation (X1.2) | |
| | Intellectual Stimulation (X1.3) | |
| | Individualized Consideration (X1.4) | |
| Intelectual Capital (X2) | Human Capital (X2.1) | [29] |
| | Structural Capital (X2.2) | |
| | Relational Capital (X2.3) | |
| Innovation (Y1) | Administrative Innovation (Y1.1) | [36] |
| | Product Innovation (Y1.2) | |
| | Process Innovation (Y1.3) | |
| Organizational Performance (Y2) | Productivity (Y2.1) | [37] |
| | Financial Performance (Y2.2) | |
| | Staff Performance (Y2.3) | |
| | Innovation (Y2.4) | |
| | Work Relationship (Y2.5) | |

# 4 Results and Discussions

## 4.1 Demographic Attributes of the Respondents

The results show that the majority of participants were male (80.9%), while the remaining (19.1%) were female. In terms of participants' age range, 57.1% were between 40-49 years old, and the age group above 50 years old comprised 42.9%. Regarding participants' education, the research indicates that 83.8% of participants have a doctorate, while the rest (16.2%) hold qualifications as professors.

## 4.2 Results of Descriptive Statistics

Table 2 presents a descriptive analysis of each indicator using mean values, composite mean values, standard deviation, and minimum and maximum values.

Table 2. Descriptive statistic

| Variable | Indicator | Mean value | Composite mean | Standard deviation |
|---|---|---|---|---|
| Transformational Leadership (X1) | X11 | 4.569 | 4.541 | 0.398 |
| | X12 | 4.552 | | 0.413 |
| | X13 | 4.533 | | 0.434 |
| | X14 | 4.510 | | 0.395 |
| Intelectual Capital (X2) | X21 | 4.490 | 4.511 | 0.422 |
| | X22 | 4.539 | | 0.385 |
| | X23 | 4.505 | | 0.383 |
| Innovation (Y1) | Y11 | 4.507 | 4.613 | 0.422 |
| | Y12 | 4.683 | | 0.382 |
| | Y13 | 4.651 | | 0.412 |
| Organizational Performance (Y2) | Y21 | 4.556 | 4.538 | 0.495 |
| | Y22 | 4.610 | | 0.459 |
| | Y23 | 4.590 | | 0.465 |
| | Y24 | 4.470 | | 0.486 |
| | Y25 | 4.463 | | 0.445 |

For example, Innovation hasthe highest average score, reaching a composite mean value of 4.613. The highest second-highest average score was observed for transformational leadership, with a composite mean of 4.541. Descriptive findings indicate that participants have diverse opinions, experiences, and perceptions regarding the studied issues.

## 4.3 Validation of Measurement Models

In this study, tests for convergent validity and discriminant validity were utilized to assess the reflective structure of the measurement model (outer model). Convergent Validity (CV) evaluates the degree of relationship between two or more constructs. Composite Reliability (CR) was employed in this study to evaluate CV. Research by [38] recommended a CR score of 0.70 or higher for a construct to be considered acceptable. As shown in Table 3, Cronbach's Alpha (CA) scores were examined as part of the measurement to assess the convergence validity of the model. Similar to CR, the minimum threshold for CA is 0.70. As indicated in Table 3, CA scores for all constructs ranged from 0.721 to 0.858, exceeding the minimum requirement of 0.70.

Furthermore, CR scores ranged from 0.843 to 0.902, surpassing the threshold requirement of 0.70 for all constructs. Additionally, Average Variance Extracted (AVE) scores were used to assess CV. All constructs in the model exceeded the minimum threshold of 0.50, with AVE scores ranging from 0.612 to 0.728, as depicted in Table 3.

Discriminant Validity (DV) is a statistical measure of the distinction between two variables, empirically used to analyze how one variable differs from another. Many previous studies have relied on [38] criteria for measuring DV. As shown in Table 3, the italicized values in the diagonal row represent the square roots of the AVE, which are higher than the correlations among variables, indicating that discriminant validity has been achieved.

Table 3. Cronbach-Alpha, Composite Reliability, and Average Variance Extracted

| | CA | CR | AVE | X1 | X2 | Y1 | Y2 |
|---|---|---|---|---|---|---|---|
| **X1** | 0.858 | 0.902 | 0.698 | 0.836 | | | |
| **X2** | 0.809 | 0.889 | 0.728 | 0.664 | 0.853 | | |
| **Y1** | 0.721 | 0.843 | 0.642 | 0.454 | 0.676 | 0.801 | |
| **Y2** | 0.843 | 0.887 | 0.612 | 0.608 | 0.691 | 0.726 | 0.782 |

Moreover, a new criterion for assessing DV in structural modeling called Heterotrait-Monotrait Ratio (HTMT), a method for calculating discriminant validity has been introduced, [39]. For

the model to achieve DV, the HTMT test score must be less than 0.85 for theoretically comparable structures and 0.90 for conceptually different structures. As illustrated in Table 4, the HTMT ratio for the constructs ranged from 0.553 to 0.809. Additionally, DV was evaluated using cross-loadings, as shown in Table 5, where items were clearly loaded into their respective constructs, further confirming discriminant validity for the model. These results confirm that the model has met the required thresholds for convergent validity and discriminant validity, enabling us to proceed with the assessment of the structural model. Thus, the research concludes that there is not enough evidence to suggest collinearity.

Table 4. HTMT ratio

| Constructs | X1 | X2 | Y1 |
|---|---|---|---|
| **X1** | | | |
| **X2** | 0.785 | | |
| **Y1** | 0.553 | 0.801 | |
| **Y2** | 0.686 | 0.807 | 0.809 |

Table 5. The value of cross-loadings and colinearity statistics (VIF)

| | X1 | X2 | Y1 | Y2 | VIF |
|---|---|---|---|---|---|
| **X11** | **0.836** | 0.465 | 0.335 | 0.467 | 2.288 |
| **X12** | **0.822** | 0.537 | 0.270 | 0.426 | 2.224 |
| **X13** | **0.872** | 0.542 | 0.383 | 0.507 | 2.372 |
| **X14** | **0.811** | 0.645 | 0.481 | 0.592 | 1.604 |
| **X21** | 0.616 | **0.906** | 0.569 | 0.637 | 2.970 |
| **X22** | 0.708 | **0.880** | 0.521 | 0.609 | 2.777 |
| **X23** | 0.374 | **0.766** | 0.637 | 0.516 | 1.357 |
| **Y11** | 0.407 | 0.677 | **0.769** | 0.538 | 1.276 |
| **Y12** | 0.349 | 0.522 | **0.856** | 0.617 | 1.776 |
| **Y13** | 0.327 | 0.400 | **0.775** | 0.592 | 1.567 |
| **Y21** | 0.528 | 0.753 | 0.734 | **0.774** | 1.518 |
| **Y22** | 0.541 | 0.438 | 0.597 | **0.794** | 2.451 |
| **Y23** | 0.509 | 0.377 | 0.467 | **0.754** | 2.288 |
| **Y24** | 0.406 | 0.546 | 0.489 | **0.794** | 3.950 |
| **Y25** | 0.352 | 0.503 | 0.463 | **0.794** | 3.917 |

## 4.4 Evaluation of Structural Model

In this study, tests for convergent validity follow the research by [38] that uses a five-step method for evaluating the structural model. These steps include collinearity assessment, analysis of path coefficients, determination of the coefficient of determination (R-square), examination of effect size (f-square), evaluation of predictive relevance (Q-square), and implementation of blindfolding. Each of these steps is detailed below. Initially, the assessment involves checking for collinearity issues among the variables. As indicated in Table 5, the Variance Inflation Factor (VIF) values for all model variables fell within the range of 1.281 to 3.36, which is below the recommended threshold of 5.0 [38], indicating no significant collinearity concerns identified in the study.

### 4.4.1 Hypothesis Testing Results and R-Square (R2)

The R-square value has been used as the coefficient of determination to measure the extent to which the variance of a particular endogenous latent variable is explained by exogenous latent variables. In the model proposed in this study, the results indicate that 62.8% of the variance can be explained by innovation and organizational performance. Four (4) out of five (5) direct hypotheses have been supported in the model. Specifically, the hypothesized paths have shown the following results.

Table 6. Hypothesis testing or structural model results

| Relationship (Path) | Original Sample (O) | T Statistics (\|O/STDEV\|) | P Values | Decision |
|---|---|---|---|---|
| Transformational Leadership (X1) -> Innovation (Y1) | 0.008 | 0.073 | 0.942 | Not supported |
| Transformational Leadership (X1) -> Organizational Performance (Y2) | 0.262 | 2.482 | 0.013 | Supported |
| Intellectual Capital (X2) -> Innovation (Y1) | 0.671 | 7.599 | 0.000 | Supported |
| Intellectual Capital (X2) -> Organizational Performance (Y2) | 0.196 | 1.998 | 0.046 | Supported |
| Innovation (Y1) -> Organizational Performance (Y2) | 0.474 | 5.388 | 0.000 | Supported |

The model indicates that transformational leadership has a significant and positive influence (Beta = 0.262, P-value = 0.013) on organizational performance. Additionally, intellectual capital has a significant positive influence (Beta = 0.671, P-value = 0.000) on innovation and has a significant positive influence (Beta = 0.196, P-value = 0.046) on organizational performance. Similarly, innovation has a significant positive influence (Beta = 0.474, P-value = 0.000) on organizational performance. However, in this study, transformational leadership has a positive but nonsignificant influence (Beta = 0.008, P-value = 0.942) on innovation. For detailed

information on hypothesis testing or structural model results (Table 6 and Figure 2).

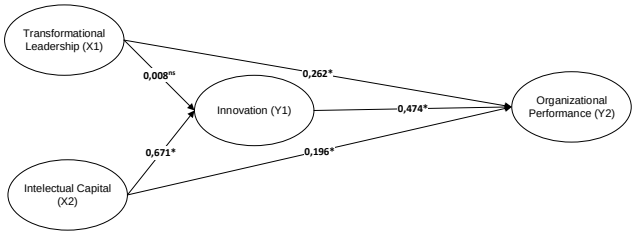


Fig. 2: Research Results Model

### 4.4.2 Predictive Accuracy

The Q-square evaluates how well a model predicts outcomes. It specifically examines the relevance of the endogenous variable within the model, with any value above zero indicating predictive relevance. The predictive relevance of the structural model can be evaluated using the Stone-Geisser Criteria, [38], [39]. Table 7 illustrates that the model's predictive relevance was assessed through the PLS-SEM blindfolding method, which involves evaluating cross-validated redundancy. The cross-validated redundancy score for the endogenous variable (innovation and organizational performance) exceeded zero, indicating the predictive significance of the path model.

Table 7. Construct cross-validated redundancy

| | SSO | SSE | $Q^2$ (=1-SSE/SSO) |
|---|---|---|---|
| Transformational Leadership (X1) | 420.000 | 420.000 | |
| Intelectual Capital (X2) | 315.000 | 315.000 | |
| Innovation (Y1) | 315.000 | 229.253 | 0.272 |
| Organizational Performance (Y2) | 525.000 | 337.668 | 0.357 |

## 4.5 Discussions

This study conceptualizes a model based on the relationships confirmed in several previous studies. The theoretical integration of relevant introductions forms the framework for this research. The study reveals two distinct understandings regarding the role of transformational leadership in the context of innovation and organizational performance.

The results suggest, first, that there is a very small relationship between transformational leadership and innovation within organizations. The results of this study confirm the complexity intrinsic in transformational leadership styles as a potential driver for innovation capabilities within an organization. Broadly speaking, although transformational leadership triggers a series of mechanisms that can be considered as driving the creation of an innovative organizational culture and encouraging subordinates to express their creativity, these effects do not seem necessarily robust with respect to changes in innovation efforts. These results emphasize the necessity of considering organizational context in researching transformational leadership and innovation.

Creating houses can be difficult for transformational leaders, especially in such organizations with a rigid hierarchy or a habitual culture. This reinforces the idea that a transformational approach affects innovation differently with availability and organizations' commitment toward this. These findings continue to inform the debate on whether transformational leadership works for innovation in organizations, iterated from prior researchers such as research by [18] and [19]. This relationship is determined by the observed variations in some research methods, organizational contexts, and different sample features, which necessitates more needed research.

Also, the study indicates a significant positive relationship between transformational leadership and performance. Positive work environments mean increased productivity and leaders who inspire their teams to do great things. This spreads to individual people and strengthens their attitude towards continuous improvement, creativity as well interpersonal relationships. This is consistent with earlier work by [22] and [23], which demonstrated a significant relationship between transformational leadership and organizational performance. Happy and inspired teams are more productive, which is the backbone of an organization.

The research further highlights the importance of this nexus between intellectual capital and innovation. Human, structural, and relational capital should be managed properly as it facilitates an innovative organizational culture. Intangible assets, such as knowledge, skills, expertise, networks, and systems are important inputs for developing better business processes. These results are in line with the findings of [25] and [27], which showed the importance of intellectual capital to innovation. Given the dynamic placement of markets in global competition, any category also underscores human resources and networks-intellectual assets that sequestrate performance.

It also offers evidence of a positive relationship between intellectual capital and organizational performance. Performance improvement is based on the management and mobilization of intellectual capital (human, structural, and relational). This

result is consistent with the findings of previous studies carried out by [28] as well as research by [29] on intellectual capital's effect on organization performance. You must maintain these assets properly in order to accomplish your projects and cultivate a competitive position among other players in the market.

In a nutshell, the findings underscore just how critical innovation is to enhancing organizational performance. In a time when the creation of value and viability is contingent on new business models, operational excellence & innovative products, more innovation is required than ever before. Studies by [32] and [33] provide some support for the beneficial effects of technology on performance. Businesses that are responsive to market shifts, taking an open approach towards process optimization tend to be a step ahead of the competition when it comes to achieving their goals. At a high level, the evidence from this review supports that innovation is important to increasing organizational performance. Organizations must also strategically balance innovative development strategies in order to sustain a competitive advantage, [40], [41].

## 5 Conclusions

The study seeks to examine the complex relationships among transformational leadership, intellectual capital, innovation, and organizational performance of Indonesian public universities. The findings emphasize the interplay between these elements and how they influence the performance and innovativeness of a company as a whole. While transformational leadership has a positive effect on innovation capacity (rate of innovation generation), it does not have a consistently positive effect on innovation performance (execution), further indicating the significance of organizational context in fostering innovation.

The importance of investing in transformational leadership when it comes to achieving organizational goals is conventional wisdom, as inspirational and motivational leaders result in greater effectiveness, individual productivity, and performance. The study also highlights the positive effect of intellectual capital on performance and innovation. Managing intellectual assets—knowledge, skills, and relationships—improves innovation capabilities while helping to maintain a competitive advantage. The better an organization is at creating new products, services, or even business models, the more successful it will be in meeting its goals and competing in the marketplace.

The practical implications of this research highlight the need to promote transformational leadership, enhance knowledge management, and foster an innovation culture. Additionally, the study emphasizes the importance of contextualizing the interactions between these factors and calls for further research to explore these dynamics in different settings. Future research should focus on industry-specific analyses to uncover diverse interactions in various sectors. Combining quantitative and qualitative methods, such as interviews or focus groups, can provide deeper insights into these complex relationships, enhancing the credibility and practical relevance of the findings.

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**Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)**

- Suparwadi was responsible for the research planning, methodology development, and data collection. He also played a role in data analysis, interpreting the results, and drafting the manuscript.
- Mochammad Al Musadieq, Muhammad Faisal Riza, Benny Hutahayan contributed to formulating the research framework and reviewing related literature. Additionally, she provided valuable insights and guidance in the data analysis process and result interpretation.

All the authors involved in interpreting the research findings, drafting the discussion section, and providing clinical and practical perspectives on the research findings. Additionally, she assisted in the revision and refinement process of the article.

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The authors have no conflicts of interest to declare.