

THE EFFECT OF DIGITAL LEADERSHIP ON MOTIVATION, ENGAGEMENT, AND EMPLOYEE PERFORMANCE USING SOCIAL NETWORK ANALYSIS METHOD: EVIDENCE FROM THE LARGEST HIGHWAY TOLLROAD IN INDONESIA (INFRASTRUCTURE COMPANY)

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Abstract

The existence of the Covid-19 pandemic has an impact on accelerating digitalization or digital transformation. This impact forces the use of technology more massively and becomes a big challenge for several companies. The study will be conducted at one of Indonesia's largest toll road companies, which was affected by digital transformation. Companies that adopt digital leadership are considered to perform better. Leadership practices have evolved to adapt to this changing landscape with the increasing adoption of digital technologies in the workplace. This study utilizes SNA to investigate the relationship between digital leadership and employee motivation, engagement, and performance. The findings reveal that digital leadership positively influences employee motivation and engagement, improving employee performance. Specifically, leaders who demonstrate effective digital leadership behaviours such as leveraging technology, promoting digital collaboration, and fostering a digital culture are more likely to have motivated, engaged, and high-performing employees. These findings contribute to understanding how digital leadership impacts employee outcomes in companies. The implications of this research suggest that organizations should invest in developing digital leadership capabilities among their leaders to enhance employee motivation, engagement, and performance in the digital era. This study also highlights the importance of leveraging SNA as a valuable research method to examine leadership dynamics in the digital workplace.

Keywords: Leadership, digital leadership, motivation, employee engagement, employee performance, social network analysis.

How To Cite:	Rr. Hernitasari A, Mone S. Andrias (2022) The Effect Of Digital Leadership On Motivation, Engagement, And Employee Performance Using Social Network Analysis Method: Evidence From The Largest Highway Tollroad In Indonesia (Infrastructure Company), Vol. 7, No. 11, November 2022, http://Dx.Doi.Org/10.36418/Syntax-Literate.v7i11.12655
E-Issn:	2548-1398
Published By:	Ridwan Institute

Introduction

Most companies that compete globally have been transformed into digital companies (Abollado & Shehab, 2018; Barchiesi & Colladon, 2021; Berné-Martínez et al., 2021; Cabras & Mount, 2017; Palmié et al., 2020). Digital technologies are disrupting the constraints facing businesses and their strategies. Under new demands and conditions, companies need to adapt and thrive. Without digital leaders who are experts in strategic thinking and using improvements in each digital technology wave to create new business opportunities that add value to their clients, this adaptation can't be made. For companies to survive in the new digital era by adapting and transforming business strategies, digital leadership is crucial. A strong digital leader will help define the digital business strategy, resulting in high performance (Sheninger, 2019).

Digital leadership is described as a leadership style combining transformational leadership types and digital technology (Collignon et al., 2016). Digital leadership is strategic leadership that can use the Company's digital assets to achieve company goals in driving business transformation. The use of digital technology marks the role of digital leadership, data as a basis for decision-making, and the direction of innovation and renewal (Coskun-Setirek & Tanrikulu, 2021). Digital leadership refers to the ability of leaders to lead and navigate their organizations in a digitally driven world. Social network analysis (SNA) is used to study social networks by analyzing the relationships between individuals, groups, and organizations. In digital leadership, SNA can be used to analyze an organization's social networks and connections to understand better communication patterns, information flows, and decision-making processes.

SNA can provide insights into the structure of an organization's social network, including the centrality of individuals or groups within the network, the strength, and directionality of relationships between individuals, and the existence of subgroups or cliques. By analyzing these network characteristics, digital leaders can identify opportunities to improve communication and collaboration within their organizations and to leverage existing relationships and networks to achieve their goals.. This approach develops experienced, successful, and digitally skilled organizations by highlighting the digital intelligence of leaders (Kane et al., 2015).

According to DuPre (2021), in the era of VUCA (Volatile, Uncertainty, Complexity, Ambiguity), Indonesia's largest toll road companies are responsible for planning, constructing, operating, and maintaining toll roads and other facilities. Companies need to make quick business adjustments or transformations, and appropriate to remain competitive in the toll road industry. Companies need to carry out digital transformation, which is a big challenge for leaders, especially for the Company's primary business.

The impact of the Covid-19 pandemic greatly affected traffic volume, which could directly impact the Company's financial performance. Therefore, the Company needs to adjust its strategic plan, which must also be balanced with leaders' readiness. The leaders who are ready to be involved in digital transformation and who can work

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with teams with the same goal so that they can maintain the Company's business according to the objectives.

In conducting research using the social network analysis method, researchers will identify the role and position of each team member, which is very important. Sueur et al., (2011) also categorize several things researchers can do in collecting relational data. The research study's main aim is to explore the idea of digital leadership with the purpose of relevant literature review in achieving organizational performance. Therefore, this paper reveals the positive correlation in the new era between digital leadership and employee motivation and engagement in achieving employee performance to support organizational productivity. While many industries are moving through globalization more effectively, global industry strategies are reframing how digital leaders act to better understand the transformation of these processes based on their characteristics, knowledge, and experience.

Digital technology disruption makes digital and leadership capabilities equally crucial in determining a company's competitiveness (Westerman et al., 2014). Some literature defines digital leadership as a critical skill manager must possess to carry out digital transformation (Zeike et al., 2019). Through digital leadership, company leaders develop clear and meaningful visions and actualize strategies related to the digitalization process (Zeike et al., 2019). Digital leadership is the capability of superiors or supervisors to involve and develop all employees in utilizing digital technology to support companies in achieving business growth.

In previous research, it was found that the dimensions of digital leadership itself are Digital Attitude and Leadership Skills. Digital Attitude is a person's or worker's view of the digital technology used by the company to assist them in organizational or corporate activities (Rudito & Sinaga, 2017). Meanwhile, Leadership skill is the leader's ability to direct his employees to pursue the same vision and mission in developing in the digital era (Rudito & Sinaga, 2017).

According to Gistituati (2020), motivation is the desire or will that exists in an individual who stimulates the individual to take action. Winardi in Pasolong (2010: 140) explains that "work motivation is a desire that exists in an individual who encourages him to take action. Pasolong (2010) also explain that work motivation inspires or motivates someone to do something or behaviour.

According to Muthike (2016), employee engagement can be defined as the willingness of employees to go the extra mile and trust the organization and what they stand for to help the organization succeed. According to him, employee engagement is indeed something that can be measured (Trivellas et al., 2013). Employee engagement is a blend of pride, satisfaction, advocacy, and retention. Employees with high engagement will work hard, but not all employees who work hard will have engagement (Schaufeli et al., 2001). Employee engagement is the reason why companies have to think about what strategies can be done to increase employee engagement.

According to Mangkunegara (2011), employee performance results from work in quality and quantity achieved by an employee in carrying out his duties by the responsibilities given to him. According to Malayu S.P. Hasibuan (2012), performance results from work performed by someone in carrying out the tasks assigned to him based on skills, experience, sincerity, and time.

Employee performance is one of the things that are the result of creating high employee engagement. Employee performance was also disclosed by Robinson (2006), which states that employees who have strong links with the Company will improve their work performance for the Company's benefit (Robinson, 2006).

H1: Digital Leadership positively and significantly affects Employee Motivation at work.

Significant evidence suggests that digital leadership can positively and significantly affect employee motivation at work. Digital leadership involves using technology to connect, engage, and motivate employees. Digital leadership can include using digital tools to provide feedback, recognition, and training and creating a culture of collaboration and innovation. One of the key benefits of digital leadership is that it can create a more flexible and dynamic work environment. Employees can work remotely or on flexible schedules, which can help them balance their personal and professional responsibilities. Digital leadership can lead to increased job satisfaction and motivation. Overall, strong evidence suggests that digital leadership can positively and significantly affect employee motivation at work. Using technology to connect, engage, and motivate employees, leaders can create a more flexible, dynamic, and inclusive workplace culture that fosters learning, growth, and collaboration.

H2: Digital Leadership positively and significantly affects Employee Engagement.

Digital leadership uses technology to facilitate employee communication, collaboration, and innovation. Leaders using digital tools to create a culture of open communication and cooperation can increase employee engagement. Digital tools like video conferencing, instant messaging, and project management software can help employees feel more connected to their colleagues and their work, even if they are working remotely.

Digital leadership can also encourage innovation and creativity among employees. Leaders can help employees develop new ideas and solutions to challenges by providing access to digital tools and resources. Digital leadership can lead to ownership and pride in their work, increasing employee engagement.

H3: Digital Leadership positively and significantly affects Employee Performance.

Digital leadership refers to the ability of leaders to use digital technologies and strategies to drive organizational performance and growth.

One study published in the Journal of Business Research found that digital leadership positively impacts employee job satisfaction, leading to higher levels of employee

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performance. The study also found that digital leadership has a direct positive effect on employee performance.

Overall, evidence suggests that digital leadership can positively and significantly affect employee performance. Leaders can use digital technologies and strategies to drive organizational performance and growth to help employees be more creative, innovative, satisfied, and productive.

H4: Motivation positively and significantly affects employee performance.

Motivation is a critical factor in driving employee performance and productivity in the workplace. When motivated, employees tend to be more engaged, committed, and productive, leading to better job performance and outcomes.

Research studies have consistently shown a positive and significant correlation between employee motivation and job performance. When motivated, employees are more likely to take ownership of their work, be proactive in their approach, and strive to achieve their goals. Motivation, in turn, can lead to improved work quality, higher job satisfaction, and reduced turnover rates. Motivated employees are likelier to perform well and contribute positively to the organization's success.

H5: Employee engagement positively and significantly affects employee performance.

Employee engagement refers to the level of commitment, enthusiasm, and involvement an employee has toward their job and organization. When employees are engaged, they are more likely to feel motivated to perform well and achieve their goals. They are also more likely to be invested in the success of their organization and be willing to put in extra effort to help the Company succeed.

Research has shown a positive and significant relationship between employee engagement and performance. Engaged employees are more productive, have higher job satisfaction, are likelier to stay with their organization, and are more likely to be high performers.

H6: Digital Leadership positively and significantly affects Employee Performance, mediated by Motivation.

Digital leaders are skilled in using digital technology to drive innovation, collaboration, and communication in the workplace. They can create a work environment that fosters learning, growth, and engagement, improving employee motivation and performance.

Motivation is essential to employee performance; digital leadership can promote the cause. Digital leaders can use technology to provide employees access to information, resources, and training opportunities to enhance their skills and knowledge. They can also use digital platforms to recognize and reward employees for their contributions, increasing their motivation to perform at a high level.

Research has also shown that motivation can mediate the relationship between digital leadership and employee performance. In other words, when employees are motivated, they are more likely to perform well, which can be attributed, in part, to the leadership practices of their digital leaders. According to Madison (1981), employee performance is determined by the level of interaction between ability and motivation. An employee can do a job, but the job will not be done if the employee doesn't want to. So an employee's performance can appear if the employee has high work motivation in carrying out his work.

H7: Digital Leadership positively and significantly affects Employee Performance which Employee Engagement mediates

Digital leadership refers to the ability of leaders to leverage digital technologies and platforms to drive innovation, collaboration, and growth within their organizations. On the other hand, employee performance refers to the extent to which employees meet or exceed the expectations of their job roles and responsibilities. Research suggests that digital leadership positively and significantly affects employee performance. Leaders who embrace digital technologies and platforms are better equipped to inspire, motivate, and engage their employees, leading to better overall performance.

Moreover, employee engagement mediates the relationship between digital leadership and employee performance. Employee engagement refers to employees' emotional connection with their work, colleagues, and organization. When employees are engaged, they are more likely to be motivated, productive, and committed to achieving the organization's goals.

Research Method

Data collection

Researchers use quantitative research. Data collection is usually done using measuring or research instruments and quantitative or statistical data analysis. The goal is for researchers to test and prove hypotheses that have been made or determined.

The participants or respondents involved in this study were selected using a purposive sampling technique. Research sampling is based on the researcher's judgment when determining the population participating in the study. In this case, the researcher chose participants, namely several employees who work in the Company in specific units that have implemented or are implementing digitalization, by taking a sample of respondent groups in the Head Office Unit and respondent groups in the Regional and Representative Office Units. And as for the limitations of the research area are areas in several organizational units ranging from BOD-1 to BOD-8 level employees (both structural and functional) who interact most frequently with leaders directly.

This study used data collection techniques in the form of surveys to answer the problem's formulation. The data used are primary data from survey results in

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questionnaires to employees as respondents. The questionnaire contains question indicators related to this study's independent and dependent variables: digital leadership, motivation, employee engagement, and employee performance. In comparison, secondary data includes data about the company profile and activities carried out in the Company, such as work facilities, environmental cleanliness, etc.

The scale used in measuring this leadership network variable is a Likert Scale between "1" = Very Little to "4" = Very Many. Meanwhile, related to digital leadership, motivation, employee engagement, and employee performance variables, researchers use a Likert scale of 1 - 6. The scale details used are between "1" = Strongly Disagree to "6" = Strongly Agree. Researchers use this scale because it overcomes the potential central tendency bias faced by Asian respondents (Huang & Czech, 2007).

The questionnaire was prepared as an online form submitted through the secretary of each Work Unit. The questionnaire consisted of 56 core questions, of which 1 question to measure leadership network variables, six questions to measure digital leadership variables, 12 questions to measure motivation variables, 22 to measure employee engagement variables, and 15 to measure employee performance variables. Regarding the digital leadership variable, respondents are required to assess other employees in the same workplace. The researcher also attached several demographic questions from the respondents that will be used in conducting descriptive analysis in this study.

Data Analysis

The research analyzed the effect of digital leadership on motivation, employee engagement, and employee performance using the SNA analysis method. In testing the proposed hypothesis, researchers used path analysis because it can explain the relationship between observed variables and independent variables through their indicators as a unit.

In this study, using Social Network Analysis, researchers can analyze the digital leadership of each leader in several organizational units that will be sampled in data collection, aiming to recognize the factors that affect employee motivation and performance against the influence of digital leadership. Researchers use the concepts of density and centrality in analyzing this digital leadership.

Result and Discussion

The research was carried out in three stages: the wording test, pre-test and primary test. Researchers conducted a wording test on 5 (five) respondents. Based on the wording test, the researcher readjusted the use of words and sentences in the questionnaire based on suggestions from the respondents. Furthermore, researchers conducted validity and reliability testing at the pre-test stage, which was conducted on 29 respondents from 3 (Three) Work Units. The variables used in this pre-test stage include digital leadership, motivation, employee performance, and employee

engagement. Pre-test data processing was carried out using Smart PLS. Smart PLS is data processing software using the partial least squares (PLS) method. The Institute of Hamburg, Germany, developed this software. All indicators in the pre-test were declared valid and reliable.

Because all indicators at the pre-test stage were declared valid and reliable, the researchers decided to use all of these indicators at the main test stage. The main test stage was conducted on 102 respondents who were employees who worked for the Company that was the subject of this study, consisting of 7 (Seven) Work Units.

Researchers use validity tests by looking at the Significance value. If the Significance (Sig.) <0.05 , it means that there is a correlation between the variables being connected, but if the Significance value (Sig.) >0.05 , it means that there is no correlation between the variables being associated.

Based on the validity test results on all variables, the relationship between variables is obtained with a significant value of <0.05 .

In addition, to find out the level of consistency of a questionnaire used in research so that the questionnaire can be trusted for data collection, reliability testing was carried out in this study using Cronbach Alpha which utilizes Smart PLS. Cronbach Alpha is a benchmark used to describe the correlation or relationship between the scale made with all existing variable scales. The instrument used in the variable is said to be reliable if it has a Cronbach Alpha of more than 0.60. Based on the results of the pre-test reliability test on the digital leadership variable, it has a Cronbach Alpha value of more than 0.60, which means that the instrument used in the variable is reliable.

Table 1
Cronbach Alpha value

Variable	Cronbach Alpha	Reliability
Digital Leadership	0.754	<i>Reliable</i>
Motivation	0.754	<i>Reliable</i>
Employee Engagement	0.754	<i>Reliable</i>
Employee Performance	0.754	<i>Reliable</i>

Based on the results of the pre-test reliability test on the digital leadership variable, it has a Cronbach Alpha value of more than 0.60, which means that the instrument used in the variable is reliable.

Here is a Diagram Model of Bootstrapping P Value Path Coefficient Direct Effects:

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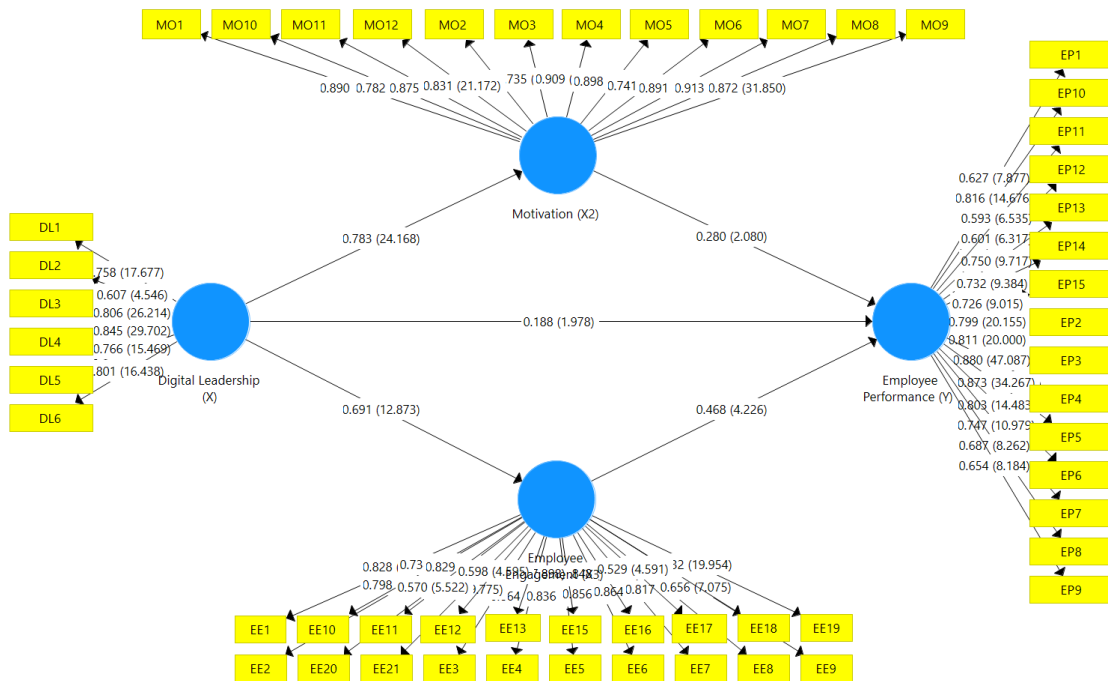


Table 2
Path Coefficient Output

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Digital Leadership (X) -> Employee Engagement (X3)	0.691	0.704	0.054	12.873	0.000
Digital Leadership (X) -> Employee Performance (Y)	0.188	0.175	0.095	1.978	0.048
Digital Leadership (X) -> Motivation (X2)	0.783	0.797	0.032	24.168	0.000
Employee Engagement (X3) -> Employee Performance (Y)	0.468	0.487	0.111	4.226	0.000
Motivation (X2) -> Employee Performance (Y)	0.280	0.281	0.134	2.080	0.038

The Path Coefficient Output, as shown in the table above, is to see the magnitude of the direct effect (DIRECT EFFECT) of each independent variable (exogenous) on the dependent variable (endogenous). So, based on the p-value of direct impacts as in the table above, the immediate effect of X, X2, and X3 on Y is not significant or accept H0 because all p-values are more than 0.05, and the rest are substantial.

The conclusions of the previous hypotheses are:

1. The p-value of the effect of Digital Leadership (X) on Motivation (X2) is 0.000 which is <0.05 so accept H1, meaning that there is a significant effect of X on X2.
2. The p-value of the effect of Digital Leadership (X) on Employee Engagement (X3) is 0.000 which is <0.05 so accept H1, meaning that there is a significant effect of X on X3.
3. The p-value of the effect of Digital Leadership (X) on Performance (Y) is 0.048 which is <0.05 so accept H1, meaning that there is a significant effect of X on Y.
4. The p-value of the effect of Motivation (X2) on Performance (Y) is 0.038 which is <0.05 so accept H1, meaning that there is a significant effect of X2 on Y.
5. The p-value of the effect of Employee Engagement (X3) on Performance (Y) is 0.000 which is <0.05 so accept H1, meaning that there is a significant effect of X3 on Y.

As for the analysis of the causal relationship between the four variables tested, each has a relationship where digital leadership affects the motivation that arises from each employee and employee engagement and performance.

The results of the analysis using Social Network Analysis have obtained density, namely the average relationship that exists in one Unit, eigenvector centrality, which is to find out the actors who have the most relationships in their units, degree centrality, namely the highest value in a network showing the most network level in the Unit, outdegree, namely the outgoing relationship from one actor to another actor, indegree is an incoming relationship from one actor to another, closeness centrality is an actor who has the ease of interacting and disseminating information from one actor to another in a network, while betweenness is to determine the actor who controls information or the actor who acts as a facilitator in handling information in a network.

Table 3
Social Network Analysis

<i>Unit</i>	<i>Pimpinan Unit</i>	<i>Density</i>	<i>Degree Centrality</i>	<i>Betweenness</i>
STO	“STO01”	33%	<i>Indegree</i> “STO01” <i>Outdegree</i> “STO04”	“STO09”, “STO04”, “STO08”, “STO02”, “STO01”
CFI	“CFI01”	55%	<i>Indegree</i> “CFI01” <i>Outdegree</i> “CFI09”	“CFI01”, “CFI09”, “CFI02”, “CFI05”, “CFI08”, “CFI03”

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CPP	“CPP01”	77%	Indegree “CPP01” Outdegree “CPP07”, “CPP08”, “CPP09”, “CPP04”, “CPP05”, “CPP13”, “CPP11”, “CPP10”	“CPP01”, “CPP04”, “CPP08”, “CPP05”
HCD	“HCD01”	43%	Indegree HCD01 Outdegree HCD18	“HCD01”, “HCD03”, “HCD05”, “HCD18”, “HCD07”, “HCD14”, “HCD04”
EPL	“EPL01”	46%	Indegree “EPL01” Outdegree “EPL16”, “EPL17”, “EPL19”	“EPL17”, “EPL01”, “EPL03”, “EPL09”, “EPL04”, “EPL08”, “EPL07”, “EPL15”, “EPL16”, “EPL13”, “EPL05”.
RNT	“RNT01”	58%	Indegree “RNT01” Outdegree “RNT18”, “RNT12”, “RNT10”, “RNT09”, “RNT19”, “RNT20”	“RNT01”, “RNT02”, “RNT03”, “RNT04”, “RNT05”, “RNT08” “RNT09”, “RNT10”, “RNT11”, “RNT12”, “RNT13”, “RNT14”, “RNT15”, “RNT17”, “RNT18”, “RNT19”, “RNT20”
ROM	“ROM01” & “ROM02”	71%	Indegree “ROM04”, “ROM05” Outdegree “ROM01”, “ROM07”, “ROM03”, “ROM09”, “ROM06”	“ROM01”, “ROM03”, “ROM06”

Based on the analysis using the social network analysis method above, each Unit has a different density level. The highest are CPP, ROM, RNT, CFI, EPL, HCD, and STO. It was found that it is not always the Unit Leader who has the best leadership traits and is recognized among his team. Degree centrality analysis for Indegree, which is the highest value in a network, namely the incoming relationship from one actor to another, how the actor is assessed by other actors in the team, is mostly seen in the Unit Leader, except for the ROM Unit. The ROM Unit is a Representative Office Unit that performs a technical operation monitoring function led by a Management Representative at the BOD-2 level. As for Outdegree, namely the incoming

relationship from one actor to another, how the actor assesses other actors in the team is seen in several employees, not only the Unit Leader. The leadership network is drawn between one group and another. Most team members consider that they often interact with other team members and assess other team members as having good leadership skills.

They are supported by betweenness analysis where for actors who control information, or actors who act as facilitators in managing information in a network there is usually more than one or even almost half of the number of employees in the Unit.

From the results of the above analysis, it can be concluded as follows based on the results of Social Network Analysis, a leadership network mapping is obtained, which can support Management, primarily Human Capital, in determining candidates for a good leader who can help the achievement of Company performance. We can know leadership patterns, communication, and compatibility between employees and their superiors are obtained, making it easier for a leader and Management to develop team strategies and the distribution of targeted assignments so that they can support the achievement of Company performance. Based on the results of Path Analysis, it is found that digital leadership influences motivation, employee engagement, and employee performance to assist Management in preparing a cadre of leaders who can support this.

Suppose it is related to the results of the hypothesis analysis of the relationship between digital leadership and the variables of motivation, employee engagement, and employee performance based on the study's results using SNA. In that case, it can be concluded that the actors who appear prominent in the SNA analysis, both using degree centrality and betweenness analysis seen from the correlation matrix, have a self-assessment of themselves with a relatively reasonable and appropriate assessment. The employee with a leadership spirit, mainly digital leadership, can influence other employees in motivation, engagement, and performance.

The suggestions that can be proposed to support further research, this research has limitations on the scope where it is only carried out on samples in several work units in a company. In the future using, this method can be used for implementation in work units or companies as needed. So that this research can be developed into further study using more specific variables related to leadership.

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First publication right:

Syntax Literate: Jurnal Ilmiah Indonesia

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