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Leading millennials to 4.0 organization

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C H R O N I C L E

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A B S T R A C T

Millennials are the generation that lived in the era of information technology revolution with the emergence of the internet and smart phones. Because of this experience, millennial has become an important element for human resources to meet industry 4.0. However, it is not clear how older leadership behaves on this generation and what impact they have on organizational performance. Thus, this paper focuses on investigating the effect of openness on millennial employee style on leadership effectiveness and its impact on 4.0 organizational performance. Survey is conducted on 224 millennial employees working in various companies in Indonesia. Data are analyzed using Smart-PLS 3.0 based on structural equation modeling (SEM). Our results showed that openness to millennial employee style had a positive effect on 4.0 organizational performance partially mediated by 4.0 leadership effectiveness in industrial settings. These results confirm the role of millennial in shaping organizational performance and how managers need to implement appropriate measures to manage millennials and be open to various characteristics of this generation.

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1. Introduction

The role of employees and leadership continues to be a vital issue in modern organizations (Hecklau et al., 2016). Recently, there is a focus on a new type of organization, called 4.0 organization (Prifti et al., 2017; Shamim et al., 2016). 4.0 organization is an organization characterized by cyber-physical systems, smart technology, microcomputers networks, and linkage between machines and value chain (Shamim et al., 2016). The organization needs not only general competencies, but also special competencies in information systems, economics, information technology, computer science, and engineering (Prifti et al., 2017). Clearly, 4.0 organization is the future of the organization. This is the organization that will work efficiently and effectively in the time where the internet already intruding into all aspects of human life. Consequently, organizations should evolve their knowledge base, including human resources, to 4.0 organization requirements. Many of the required competencies to create a 4.0 organization resides in the new generation of employees, called millennials (born between January 1983 and December 1994). These are people who live in the era of communication and information technology revolution. Some of them are the players responsible for the transformation of world technology. Yet, people already live in the organization came from the older generation (born before 1983). They will become the leaders of the millennials who sooner or later, will enter the organization. However, understanding of the effects of generational differences of employees on leadership effectiveness and organizational outcomes on this organization largely remains ignored. This is a problem since generational differences likely to have effects on organizational dynamics and behavior. This is especially worrisome for millennials which largely disappointed in business and unprepared for Industry 4.0 (Deloitte, 2018). A survey by Deloitte in 2018 on 10,455 worked millennials across 36 countries, including Indonesia, found that millennials are only confident about their future on emerging markets, which are markets that already resides on 4.0 organization. Majority of the respondents told that their organization could not help their people prepare for Industry 4.0 (49% couldn't against 36% could and 15% don't know). Deloitte (2018) conclude that millennials are disappointed that their business leaders' priorities do not seem to align with their

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own. This study contributes to Industry 4.0 literature by (a) examining the effects of openness to millennials style as a predictor of 4.0 leadership effectiveness and (b) exploring the utility of openness to millennials style and 4.0 leadership effectiveness in explaining 4.0 organizational performance.

1.1. Openness to Millennial Employee Style

Millennials are people born between January 1983 and December 1994 (Deloitte, 2018). This generation lack appeal to a manufacturing career, generally because of a bad reputation from manufacturing human resources history (Wilkins, 2007). Millennials also are known to have less commitment to one company because they try to accumulate experience and advancement from multiple organizations (Wilkins, 2007). However, this generation will represent half of the global workforce by 2020. Hence, any organization which moves toward Industry 4.0 needs to engage this workforce into their organization. Despite this, the task to develop strategies for engaging millennials in the organization still lacks implementation in the industry (Krachtt, 2018). The traditional strategy used was promoting the use of ICT (Information and Communication Technology) and IoT (Internet of Things) in the company since this generation is highly literate in information technology (Krachtt, 2018). Yet, this strategy largely ignored the human aspect of millennials, thinking that they just another component of a machine. Tech-savvy just one characteristics of millennials. Millennials also are known to be proactive individuals. They are also more likely to value time off (Twenge, 2010). They believe that office attendance is not needed on a regular basis. Flexible working arrangements are another aspect of millennials and intrinsically motivating them (Özçelik, 2015). Another characteristic of this generation is the importance of work-life balance (Özçelik, 2015). All these human side dimensions of millennials should be facilitated to get them to work for a company, especially any company who want to move to 4.0 industry. Firms must first open to these styles, which differ from previous generations of employees. Having large tech-savvy and proactive employees with the high demand of time off, flexible working arrangements, and work-life balance particularly challenging to face by any managers. In one side, the leader has highly skilled workers in advance technology field and these workers also highly proactive, making leaders job easier. On the other side, arranging a working time for these employees is difficult thing to do, not to mention they ask the lesser working time in the office or factory. Many of these employees could easily be distracted by non-job things brought by information technology in their hands. The tension to retain them in work and let them free for off-work is a form of a contradictory element which needs a new form of leadership.

1.2. 4.0 Leadership Effectiveness

Recently Lewis et al. (2014) propose paradoxical leadership theory that points the importance of openness in leadership effectiveness. Paradoxical leadership theory posits that good leadership happens when a leader could manage challenging tension that persists over time and exist simultaneously (Smith & Lewis, 2011). The leadership style characterized by "seemingly competing, yet interrelated, behaviors to meet structural and follower demands simultaneously and over time" (Li et al., 2018). Clearly, job work for millennials is structural demands, while time off, flexible working arrangements, and work-life balance are millennials demands. The effectiveness of this leadership could be judged by its relevance to 4.0 industry. Hence, we call them 4.0 leadership effectiveness. If paradoxical leaders could manage millennials effectively, they could come up with high performance and also high worker satisfaction. These are dimensions of common leadership effectiveness (Ansari et al., 2004).

1.3. 4.0 Organizational Performance

Industry 4.0 is a collective term for technologies and concepts of value chain organization brought by the revolution of information technology (Wang, 2016). Information technology revolution itself called as fourth Industrial Revolution, to differentiate it from the revolution in industrial system bought by machine production (first industrial revolution), then by assembly line (second industrial revolution), and then computers (third industrial revolution). A 4.0 organization is an organization that implements fourth industrial revolution aspects in its operations. Many of these aspects are technological, such as RFID, embedded systems, carbon fibers, etc. The performance of this organization in large part does not differ from the traditional organization. Efficiency, productivity, and profitability always became part of the organizational performance of any type of for-profit organization. However, at least two things would be characterized by 4.0 organizational performance. First, there is complexity. Hecklau et al. (2016) identify that the number of workspaces with a high level of complexity is characteristics of industry 4.0. Hence, handling this complexity would be a measure of organizational performance of this organization. Second, autonomy and sociality will increase, as a consequence of combined microprocessors and AI methodologies. Combined with heavy use of social media by millennial, millennial's view that good company should have a positive impact on social level (Pînzaru et al., 2017), and the high demand for corporate social responsibility pressed by government and society, social aspect of organizational performance becomes increasingly important for any 4.0 organization. Hence, 4.0 organizational performance would include efficiency, productivity, profitability, complexity, and sociality.

2. Hypotheses Development

Leadership effectiveness is known to be determined by culture and leadership competencies. Leadership competencies could come from any framework of leadership considered effective by theories, including paradoxical leadership. Study on paradoxical leadership shows that the leadership style is able to increase proactivity among subordinates (Zhang et al., 2015).

Millennials itself is high in proactivity, meaning that paradoxical leader could transfer these young employees' energy to its realization. The paradoxical leader also is known to show followers how to be open (Detert & Burris, 2007), and him/herself open to possible contradictory information (Wong et al., 2011). Paradoxical leaders also have an open communication style and have open-mindedness (Zhang et al., 2015). All of this relates to the needs of millennials. Leadership effectiveness is determined by the negotiation between leader and follower and this negotiation is created by openness to millennials thoughts, ideas, and opinions (Chou, 2012). A cohort study by Sessa et al. (2007) compared six generations of employees to find their most important leadership characteristics. It was found that listen well was the second most important leadership characteristics ranked by millennials, after the dedication. This differed from early Gen-Xers and Early and Late Boomers which put listen well on lower ranking than millennials. Fulfilling this expectation will increase follower satisfaction, which is a dimension of leadership effectiveness. In the same line, Graen and Schiemann (2013) found that when millennials subjected to control and command leadership style, which is closed to employees suggestions and styles, millennials lose their job enthusiasm and disengage from their work. From the above discussion, it could conclude that openness to millennials style should be positively related to 4.0 leadership effectiveness. This study, therefore, made the following prediction regarding openness to millennial style and 4.0 leadership effectiveness:

H_1: Openness to millennial style will be positively related to 4.0 leadership effectiveness.

Little research has been done to verify the important role of openness to millennial style in organizational outcomes. Previous research indicates that millennial is the main resource for organizations where organizations gain the skills, knowledge and attitudes needed to compete in contemporary business (Kuron et al., 2015), influencing how companies build cross-generational employment relations strategies to improve organizational performance (Trapero et al., 2017). Marinakou and Giousmpasoglou (2017) explain that culture influences human behavior and hence organizational performance. Furthermore, the literature on organizational and industrial psychology shows that millennial has its own culture. Because of the nature of millennials who are confident in their skills and millennial employees are familiar with the digital world (Winter & Jackson, 2016), organizations that are open to these characteristics can utilize the resources they have to produce positive performance in a digital-4.0 environment. Because 4.0 organizational performance is the performance that is relevant to the industrial environment 4.0 with millennial consumers, employees with millennial style will be able to provide services that fit consumers' needs who have the same behavior patterns as them. This is especially true for Indonesia where half of the financially strong population is millennial (Tarigan & Jacqueline, 2018). Thus, openness to millennial style can impact 4.0 organizational performance. Therefore, the second hypothesis was formulated for this study:

H_2: Openness to millennial style will be positively related to 4.0 organizational performance.

The strategic leadership theory suggests that the possibility of relationship exists between 4.0 leadership effectiveness and 4.0 organizational performance. This theory states that the organization's performance will be achieved if the leader is able to increase flexibility and empower his organizational members in a multi-functional level (Parrotto & Kim, 2018). Gardner et al. (2010) classify strategic leadership theory as a theory that explains how leaders can influence organizational performance. Setiawan and Yuniarsih (2018) use the theory of strategic leadership as an appropriate leadership theory for industry 4.0. Generally, effective leadership can have a positive effect on organizational performance. This will be more prominent in the context of industry 4.0. Oosthuizen (2016) emphasizes that leadership skills are one of three things that will determine the survival of organizations in the industrial era 4.0, in addition to creative abilities and strategic thinking. The essence of strategic leadership theory is that leaders are able to develop strategies to encourage subordinates to achieve organizational performance, including empowering subordinates' creative abilities into innovations that are important for the survival of the organization. Thus, 4.0 leadership effectiveness could lead to increasing organizational performance.

H_3: 4.0 Leadership effectiveness will be positively related to 4.0 organizational performance.

Followership is as important as leadership in determining organizational performance (Chou, 2012). High level of work meaningfulness and personal fulfillment, which could be fostered by openness to millennials style, may lead to a high level of leadership effectiveness and organizational performance (Chou, 2012). Negative millennials experiences with their leaders in the workplace give detrimental outcomes to organizational performance (Haeger & Lingham, 2013). An organization with a range of work-life policies, features that liked by millennials, shown to have higher levels of organizational performance (Perry-smith & Blum, 2000). In this way, openness to millennials style should foster good work-life policies, and then implied in organizational performance. Meanwhile, leadership effectiveness is known to influence organizational performance (Svensson & Wood, 2006). Maximized leadership effectiveness could foster organizational performance (Chou, 2012). Given the previous hypothesis, leadership effectiveness could become the mediating mechanisms linking openness to millennial style to organizational performance. Thus, it made the following hypothesis:

H_4: There will be a positive effect for openness to millennial style on 4.0 organizational performance, an effect that will be partially mediated by 4.0 leadership effectiveness.

Fig. 1 is a model examined in this research. According to the model, openness to millennial style is predicted to have direct effects on 4.0 leadership effectiveness and 4.0 organizational performance. Openness to millennial style is also predicted to have effects on 4.0 organizational performance that are partially mediated by 4.0 leadership effectiveness.

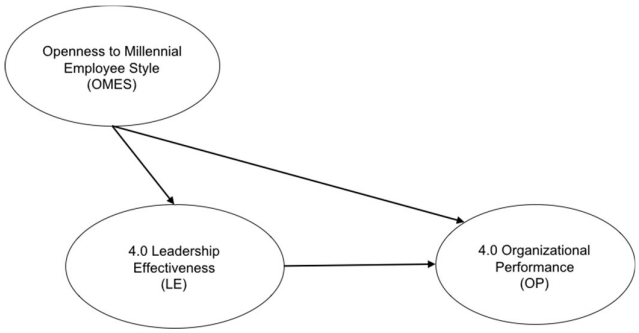

Fig. 1. A model linking openness to millennial style to 4.0 leadership effectiveness and 4.0 organizational performance

3. Method

3.1 Participants, Research Design, and Procedures

Participants were 224 Employees who worked in manufacturing companies in Jakarta. Participants completed the survey measures given by the research team by email and WhatsApp. Of the participants, 54% were male and 46% were female. Their age ranged from 25 to 36 years (M = 30, SD = 3.6). Among the participants, 17% were high school educated, and 9% were diplomas, 60% were bachelors, 12% master, and 1% Ph.D.

3.2 Measures

Openness to Millennial Employee Style (OMES) is measured at the individual level using a five-point scale developed from the characteristics of millennial employees by Karugo (2017); for example "my supervisor is open to young employees who have proactive behavior". All items were measured on a 6-point Likert type scale ranging from 1 (strongly disagree) to 6 (strongly agree). 4.0 Leadership Effectiveness (LE). 4.0 leadership effectiveness measured with two dimensions: managers' performance and workers satisfaction (Ansari et al., 2004). Managers' performance was measured with a five-items scale created from 4.0 leader performance indicators proposed by several authors (McManus et al., 2007; Parkes & Borland, 2012; Sevincer et al., 2014; Towers Watson, 2013). Example items are "my leader has collaborative problem-solving style" and "my leader has the ability to trigger a change in this company". Workers satisfaction was measured with four-item scale adapted from Mulki et al. (2015). Example items are "we satisfied with recognition gave by my leader" and "my leader always holding his/her promises". All managers' performance and workers' satisfaction items were measured on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree). 4.0 Organizational Performance (OP). 4.0 organizational performance was measured with a five-item scale developed from Donia et al. (2017) and et al. (2013). Sample items are "this organization have increased its profitability since the new leader in place" and "this organization have increased its productivity since the new leader in place". All the 4.0 organizational performance items were measured on a 6-point Likert-type scale ranging from 1 (strongly disagree) to 6 (strongly agree).

4. Results

Table 1 shows descriptive statistics and zero-order correlations between research variables. All variables have a high correlation, but confirmatory factor analysis shows that the three-factor model is more in line with the data than the one-factor model. The three-factor model fit parameters are $\chi 2$ = 503.26, df = 149, CFI = 0.905, NFI = 0.871, and RMSEA = 0.108, better than the one-factor model that has $\chi 2$ = 906.29, df = 152, CFI = 0.797, NFI = 0.767, and RMSEA = 0.157. Table 1 shows construct correlations. The value confirms the discriminant validity of the constructs.

Table 1
Means, standard deviation, and zero-order correlations (N = 224)

Variable	M	SD	1	2	3
1. Openness to millennial styles (OMES)	4.52	1.07	(.86)		
2. 4.0 Leadership Effectiveness (LE)	4.46	1.11	.78	(.86)	
3. 4.0 Organizational Performance (OP)	4.33	1.01	.65	.86	(.87)

Note. All correlation significant at p <.01. Square root of average variance extracted are shown in parentheses.

The four hypothetical relationships were examined by adopting Partial Least Square (PLS) based Structural Equation Modeling (SEM) using SmartPLS 3.0 (Ringle et al., 2015). Table 2 presents outer loading and reliability assessment. Overall, all

items and construct were very reliable with loadings over 50% of variance of their respective construct. Cronbach's alpha for all constructs were over 0.8 and average variance extracted and composite reliability values exceeded the recommended threshold 0.5 and 0.7, respectively.

Table 2
Outer loading and reliability assessment (AVE=average variance extracted)

Code	Items	Loading Factor
Openness to Millennial Employee Style (OMES) (AVE=0,739 CR=0,934)		
OMES1	My supervisor is like to young employees who expert in high-technology	0,839
OMES2	My supervisor is open to young employees who have proactive behavior	0,822
OMES3	My supervisor has intense relation with young employees who actively socialite with colleagues outside office	0,890
OMES4	My supervisor is enthusiast to communicate with young employees who enjoy flexible working hours	0,884
OMES5	My supervisor is really like to young employees who have view that work-life balance is very important in doing job	0,862
4.0 Leadership Effectiveness (LE) (AVE=0,736 CR=0,951)		
LE1	My leader has the ability to trigger a change in this company	0,864
LE2	My leader often be our surrounding	0,826
LE3	My leader always communicates with us	0,872
LE5	My leader always ask input before make decision.	0,824
LE6	We satisfy with facilities provided by our leader.	0,865
LE7	We satisfy with the fairness demonstrated by our leader	0,879
LE9	We satisfy with the promises that always delivered by our leader	0,874
4.0 Organization Performance (OP) (AVE=0,764 CR=0,928)		
OP1	This organization have increased its efficiency since the new leader in place.	0,876
OP2	This organization have increased its productivity since the new leader in place.	0,920
OP3	This organization have increased its profitability since the new leader in place.	0,848
OP5	This organization have increased its network with other company, since the new leader in place.	0,850

Table 3 presents the results of loading and cross-loadings. The results further establish discriminant validity of the items

Table 3
The matrix of loading and cross-loadings

	4.0 Leadership Effectiveness (LE)	4.0 Organization Performance (OP)	Openness to Millennial Employee Style (OMES)
OMES1	0,640	0,529	0,839
OMES2	0,593	0,515	0,822
OMES3	0,696	0,555	0,890
OMES4	0,659	0,562	0,884
OMES5	0,739	0,628	0,862
LE1	0,864	0,758	0,724
LE2	0,826	0,551	0,645
LE3	0,872	0,588	0,714
LE5	0,824	0,595	0,597
LE6	0,865	0,610	0,636
LE7	0,879	0,659	0,665
LE9	0,874	0,643	0,676
OP1	0,610	0,876	0,533
OP2	0,723	0,920	0,625
OP3	0,614	0,848	0,527
OP5	0,622	0,850	0,586

Table 4 presents the path coefficients of the structural model. Overall, H_1 was supported with positive path coefficient at the .001 nominal significance level. Hence, the structural equation modeling confirmed that openness to millennial employee style is a significant antecedent of 4.0 leadership effectiveness ($\beta = .78$, $p < .001$). At the same time, the openness to millennial employee style had a positive effect on 4.0 organizational performance ($\beta = .20$, $p < .01$) supporting H_2. Also, as expected, 4.0 leadership effectiveness had a strong positive effect on 4.0 organizational performance ($\beta = .58$, $p < .001$), supporting H_3.

Table 4
A Summary of Path Results (N = 224)

Path	B	SE	*t*-value	*p*-value
Openness to millennial styles → 4.0 leadership effectiveness***	.777	.031	25.094	.000
4.0 leadership effectiveness → 4.0 organizational performance***	.585	.074	7.940	.000
Openness to millennial style →4.0 organizational performance**	.197	.072	2.726	.003

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Bootstrapping test has been performed to test the mediating effect. The test has revealed p-value = 0.000 meaning significant indirect effect, $p < .001$. Therefore, the 4.0 Leadership Effectiveness mediate the openness to Millennial Employee Styles and 4.0 Organizational Performance relationship. Hence, Hypothesis 4 is accepted.

5. Discussion

The present study aimed to test the effects of openness to millennial employee style on industrial settings. Openness to millennial employee styles was positively related to 4.0 leadership effectiveness and 4.0 organizational performance. The 4.0 leadership effectiveness also facilitated 4.0 organizational performance. Leaders who are very intense in dealing with young employees who actively socialize with colleagues outside their offices make leaders able to bring change and their subordinates are satisfied with the recognition given by their leaders, which in turn leads to increased complexity that reflects the growth of the organization. The study has found that today leader quite open to millennial styles, which quite differ from a survey by Deloitte (2018). As can be seen, this would bring today organization to 4.0 preparedness either in leadership preparedness or in organizational performance. Altogether, these findings provide further support for the paradoxical leadership relevance to 4.0 industry and that paradoxical leader could manage millennials effectively and come up with high performance and also high worker satisfaction. Scholars have just studied aspects of leadership that can be applied to millennials. Although this has just been developed, we find that paradoxical leadership is able to bring about organizational performance through empowering millennial employees. In this way, this study adds to the literature on organizational behavior in the context of industry 4.0 (Prifti et al., 2017; Shamim et al., 2016). This is important because 4.0 organizations are very relied to technology and intellectual capital. Practically, paradoxical leadership can help in achieving the organization's performance. This is especially important for business organizations that are trying to recruit employees of the millennium who are increasingly mature and have a deep understanding of the revolutionary era 4.0.

The 4.0 leadership effectiveness consists of managerial performance and worker satisfaction, and managerial performance seems better to predict 4.0 organizational performance than workers satisfaction. The ability of a leader to bring about change seems to be stronger affecting the increase in productivity rather than employee satisfaction with recognition given by the leader. This finding is somewhat surprising, but might be attributed to the increased role of leaders in managing performance. Satisfied employees may be able to make a large contribution but this again depends on the leader in carrying out managerial actions. MacGillavry and Sinyan (2016) argued that satisfied employees depend primarily on how they are managed. Finally, while this study adds a growing literature on 4.0 organizational performance by showing three predictors for this variable, further research can explore whether openness to millennial employee styles also has effects on other constructs than leadership effectiveness and organizational performance. Brinksman et al. (2019) suggested that openness to millennial employees might increase the threat to organizations, hence could hurt the social and technological reputation of the firm. Further research using methods such as structural equation modeling with larger samples can be carried out in the future to explore these effects together with the variables in this study. The selection of indicators in this study can be a limitation. The indicators used in this study depart from the main focus on definitions drawn from several sources. There are no clear definitions of the concepts used in this literature, let alone instruments that have been tested in different settings. Future research needs to explore further about nomological networks surrounding openness to millennials, 4.0 leadership effectiveness, and 4.0 organizational performance. Further research must also be more thorough in developing and using instruments in investigating the interrelationships between these concepts. This study also acknowledges the limitations of this study based on sampling. This research is at the organizational level but we use a sample of one person representing one organization. This provides the possibility of bias in measuring the performance of the organization so that it is necessary to take samples from quite a number of people from one organization. More than that, this research uses subjective self-report which can cause its own bias. This relates to the common method bias which is common in the use of one source to collect data (Jakobsen & Jensen, 2015; Kock, 2015). Ideally, the common method bias should be minimized or avoided. For example, using a lot of people to measure an indicator for a company. Steps to use objective indicators such as company performance data can also help. However, with the limitations of getting company performance report data and many people from one company as we are dealing with, this is difficult to do. The final limitation of this study is the limitations of settings. Although learning about 4.0 organizations, it cannot be ascertained whether all the samples in this study are indeed 4.0 organizations. Indonesia is a developing country and these organizations should be at an early stage to enter the industrial era 4.0. The results obtained can be different when the sample used is an organization that is truly in organization 4.0. Future research must replicate this research in the context of organizations that are truly 4.0 organizations.

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