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Leadership Styles, Self-Efficacy, and Innovative Work Behaviour of Software Developers

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Abstract

Research Aims: The primary aims of this study involve examining the effect of leadership styles on self-efficacy and the effect of self-efficacy on innovative work behaviour.
Design/Methodology/Approach: Quantitative research was conducted by collecting data from 242 randomly selected software developers in four software development companies in Yangon using structured questionnaires. Regression analysis was used to attain the research objectives.
Research Findings: The results showed that transactional and ambidextrous leadership styles have a significant effect on increasing the self-efficacy of software developers. This study also revealed that self-efficacy is an antecedent of the innovative work behaviour of software developers.
Theoretical Contribution/Originality: The study confirmed that transactional leadership significantly impacts self-efficacy and validated the role of ambidextrous leadership in self-efficacy. Moreover, self-efficacy was found to have an impact on innovative work behaviour.
Managerial Implication in the South East Asian Context: This study suggests that transactional and ambidextrous leadership styles can create enabling environments by encouraging and empowering team members to increase their self-efficacy and engage in more innovative endeavours.
Research Limitation & Implications: Data was collected once using a questionnaire from a sample of four companies. The insights can help leaders maintain a sustainable competitive advantage, leading to more job opportunities and long-term economic growth in Myanmar and other developing countries.

Keywords: Transactional Leadership, Transformational Leadership, Ambidextrous Leadership, Self-Efficacy, Innovative Work Behaviour

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INTRODUCTION

Nowadays, firms need to innovate constantly to remain competitive and endure in the long term, whose attainment is dependent on the innovation of individual employees (De Jong & Den Hartog, 2007; Janssen, 2000; Scott & Bruce, 1994). According to Tierney and Farmer (2002), organisations need to support employees' innovative ideas in terms of boosting their self-efficacy, as proposed by Bandura (1997). Self-efficacy is the focal concept for success and growth in a contemporary dynamic environment (Malik, 2013), and leadership is a catalyst for self-efficacy development (Hughes et al., 2018). Bandura (1997) defined self-efficacy as the belief in one's capability to successfully plan and complete the tasks needed to gain a specific level of performance. The suitable styles of leadership that fit with organisational members have become indispensable for the innovative performance of software companies (Hughes et al., 2018) because a proper leadership style will enhance members' cognitive ability to work confidently at their full potential, i.e. self-efficacy (Yukl, 2013). Numerous studies have been carried out to understand the relationship between leadership styles and their effect on improving employee self-efficacy and innovative work behaviour (Mittal & Dhar, 2015). Additionally, the primary role of leaders is to stimulate and harness the creative potential of their employees, enabling them to discover innovative solutions for various challenges (Boerner et al., 2007). Accordingly, many studies have indicated that leadership style shapes self-efficacy and innovative work behaviour of individual employees in knowledge-based industries such as education, consulting, and professional services firms. For example, as Kissi's (2012) study stated, the behaviour exhibited by middle managers in their leadership roles has the potential to foster innovative work and enhance project performance within a construction professional services firm.

In developed and Western countries, there is strong evidence showing that leadership behaviour positively affects employee self-efficacy and innovation in knowledge-based industries. However, in many developing nations like Myanmar, the impact of leadership roles on workforce innovation is still being investigated. As innovation continues to play a vital role in the success and survival of organisations, especially in developing countries, it is important to study factors that enhance self-efficacy and innovative work behaviour (Agarwal, 2014). In addition, researchers and practitioners have devoted significant attention to the study of innovation to improve the innovative behaviour of employees in Myanmar (Akram et al., 2016); however, research has mainly focused on it at the organisational level and has overlooked the individual level.

In recent years, Myanmar's software industry has become one of the fundamental areas in which high technologies are developed and the most profitable global economic sectors (Ei & Kim,

2016). As the economy becomes more reliant on innovation, especially knowledge-intensive firms like software development companies, understanding innovative work behaviour is increasingly important. Despite the growing significance of ICT and software for economic development and well-being, Myanmar lags behind other developing countries in leveraging the potential of the software industry and exhibits the smallest growth in both ICT goods imports and exports. (Ing & Markus, 2023). Moreover, software companies in Myanmar are facing a significant challenge due to a lack of innovative ideas, leading to a reliance on copied software. Therefore, the software industry is chosen for investigation because it has encountered important issues despite its potential for further development.

With a high appreciation but low availability of technology, it becomes crucial to identify the factors that stimulate the pace of innovative behaviour of software developers in Myanmar. Consequently, software developers, who fuel creativity and innovation within tech organisations, become paramount for their success (Hegde & Walia, 2014). Driven by the assumption that employees' self-efficacy is critical for employees' innovative behaviour that is beneficial for work outcomes, researchers have devoted increasing attention to factors that potentially promote self-efficacy and innovative work behaviour (Zahra & Waheed, 2017). Among the varieties of the antecedents of employees' self-efficacy, this study focuses on leadership styles transactional, transformational, and ambidextrous as significant antecedents of employees' self-efficacy and innovative work behaviour (Chen et al., 2014; Jansen et al., 2009; Zacher & Rosing, 2015).

Understanding the importance of software developers' innovative work behaviour in software development companies, the purpose of the study is to investigate how leadership styles contribute to the development and enhancement of self-efficacy and to provide insights into the relationships between self-efficacy and innovative work behaviour of software developers. The study aims to achieve the following specific objectives:

1. To examine the effect of leadership styles on the self-efficacy of software developers.
2. To analyse the effect of self-efficacy on the innovative work behaviour of software developers.

LITERATURE REVIEW

At the present time, research has indicated that leadership plays a vital role in improving employees' self-efficacy. This self-efficacy, in turn, can influence innovative work behaviour that is indispensable for organisational success and survival (Jiang et al., 2021; Liu & Gumah, 2020; Zahra & Waheed, 2017).

Self-Efficacy

Bandura (1986) first proposed the self-efficacy theory, which is generated from social cognitive theory. Self-efficacy's social dimension is the concept that human thoughts and behaviours are influenced by what individuals absorb from their surrounding society. In contrast, the cognitive aspect refers to the notion that cognitive processes play a role in shaping individuals' motivations, attitudes, and behaviour. Malik (2013) pointed out that self-efficacy is an employee's confidence and belief in their own skills and capabilities to gather motivation, cognitive resources, or necessary actions to effectively complete a specific task in a particular situation. In this way, people with a strong belief in their own abilities will persistently work towards their goals. Even when faced with challenges, they will strive to sustain their efforts until they reach their desired outcome or performance level (Sahertian & Soetjipto, 2011). For this study, self-efficacy is described as the perception in which an individual believes they possess the capability to successfully complete tasks.

Leadership Styles

Rost (1997) defined leadership as an interdependent bond between leaders and collaborators committed to implementing concrete changes in line with their shared goals. In the context of software development companies, transformational, transactional, and ambidextrous leadership are considered effective leadership styles that can affect employees' innovative behaviour through employees' self-efficacy to construct actual creative performance (Hughes et al., 2018). In the present research, the term "leader" is used to describe the team member who holds an immediate position of authority and demonstrates behaviours and approaches while engaging with their team members in a software development team.

Relationship Between Transactional Leadership and Self-Efficacy

According to Bass (1997), transactional leadership involves the leader closely monitoring and controlling the progress of tasks among employees. In this style, the leader clarifies the responsibilities and objectives of the employees' tasks (Yukl, 1999). Transactional leadership emphasises leader behaviours that are oriented towards tasks (Bass & Bass, 2008). These behaviours involve establishing structure and implementing transactional leader actions, specifically contingent reward and management by exception-active. These actions are focused on tasks and involve defining the roles and relationships among group members, coordinating their actions, setting standards for task performance, and ensuring that group members meet those standards (Yukl, 2013). This means that transactional leader provides structure, instruction, and supervision to their subordinates. They can motivate their workers by offering something they want in exchange for completing tasks as the leader wants. In addition,

transactional leadership is associated with future orientation, as it has been found to enhance self-efficacy (Mehdinezhad & Mansouri, 2016; Turner et al., 1997). In carrying out tasks related to information technology, according to Safarudin et al. (2015), self-efficacy pertains to an individual's assessment of their own abilities and competence. Their research findings provided additional support for the positive effect of transactional leadership style on computer self-efficacy among computer operators. Therefore, transactional leadership and self-efficacy are closely related, as transactional leaders motivate their subordinates through external rewards and incentives, aligning with the concept of self-efficacy. Thus, the following hypothesis was formed:

Hypothesis 1: Transactional leadership has a positive relationship with self-efficacy.

Relationship Between Transformational Leadership and Self-Efficacy

In accordance with the initial theories proposed by Bass (1985) on transformational leadership, the concept of transformational leadership can be understood as a behaviour that is focused on facilitating change. Transformational leaders encourage their employees to adopt and adapt to workplace changes to maintain stability in an organisation (Ibrahim et al., 2023).

Transformational leadership involves displaying behaviours characterised by demonstrating concern and respect towards followers, safeguarding their well-being, and expressing gratitude and support (Bass, 1990). Furthermore, transformational leaders prioritise the collective interests of the group and conduct themselves in a manner that fosters respect from followers, similar to considerate leaders who prioritise the welfare of the group and treat all members as equals (Bass, 1990). According to Yukl and Taber (2002), transformational leaders excel in conveying an inspiring and captivating vision of the future and actively encourage diverse viewpoints from team members, question underlying assumptions, and fearlessly embrace calculated risks.

According to Yulianto et al. (2021), transformational leadership can enhance employee self-efficacy in terms of intellectual stimulation, charisma or idealised influence, and inspirational motivation. Azim et al. (2019) stated that their study emphasises the significant effect of transformational leadership on creative self-efficacy. It is revealed that the supportive actions from transformational leadership contribute to strengthening employees' belief in their own abilities, reinforcing their self-efficacy, and ultimately encouraging increased participation in creative activities. Thus, the following hypothesis was formed:

Hypothesis 2: Transformational leadership has a positive relationship with self-efficacy.

Relationship Between Ambidextrous Leadership and Self-Efficacy

According to Tushman and O'Reilly's 1996 argument, leaders operating in a competitive environment must possess ambidexterity. In other words, they should have the ability to execute diverse strategies simultaneously, encompassing "*exploration and exploitation, incremental and radical approaches, as well as flexibility and control*" (Vera & Crossan, 2004, p. 227). Nevertheless, there are situations where leaders must employ transactional behaviours, particularly when the organisation is in a stable position and the primary learning objectives involve refining and restoring balance. In such instances, transactional leadership, which prioritises structure and routine, becomes the appropriate approach.

Ambidextrous leadership can potentially create and enhance self-efficacy in individuals. As Jiang et al. (2021) described, an ambidextrous leadership style can create self-efficacy because ambidextrous leaders possess the skill to effectively uphold a harmonious equilibrium between incremental innovation, which focuses on optimising existing processes and ideas (exploitation), and discontinuous innovation, which involves exploring new territories and radical breakthroughs (exploration) (Tushman & O'Reilly, 1996).

For creating new and creative ideas, ambidextrous leadership has a crucial part in encouraging diverse behaviours among employees and effectively utilising organisational factors to positively influence their creative self-efficacy and innovative work behaviour. Thus, the following hypothesis was formed:

Hypothesis 3: Ambidextrous leadership has a positive relationship with self-efficacy.

Relationship Between Self-Efficacy and Innovative Work Behaviour

Innovative work behaviour means identifying problems, bringing valuable ideas, and taking the necessary actions to develop and implement those ideas (De Jong & Den Hartog, 2007). Kanapathipillai et al. (2021) found that self-efficacy has a positive impact on innovative behaviours. This suggests that when an employee possesses higher levels of self-efficacy, they are more likely to exhibit greater innovative behaviour. Moreover, Zahra and Waheed (2017) elucidated that when individuals have a strong belief in their own capabilities, it helps them to be more innovative in their work. The following hypothesis was formed:

Hypothesis 4: Self-efficacy has a positive relationship with innovative work behaviour.

Based on the above literature review, the conceptual framework of the study is established, as illustrated in Figure 1.

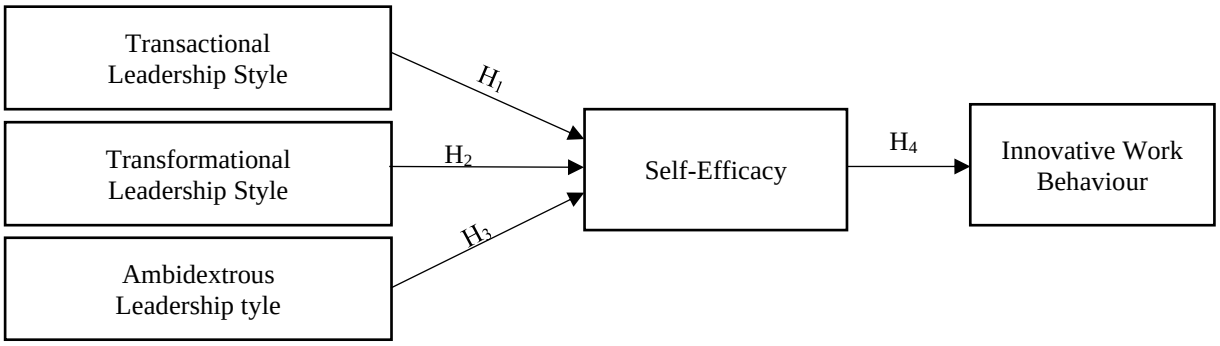


Figure 1. Conceptual Framework of the Study

RESEARCH METHOD

Population and Sample

In this study, quantitative research was used. According to the Myanmar Computer Industry Association (MCIA) (2022), there are 62 software development companies in Yangon that are registered in the Yangon Region Computer Federations. Among them, the four largest software companies with more than 100 software developers were selected because they are long-established companies and play a crucial role in shaping the development of e-commerce and the digital economy in Myanmar. For respondents, the software developers working at the four software development companies were chosen. Based on the data from MCIA, there are 610 software developers working at the four selected companies in 2022. In this study, software development companies are defined as organisations that specialise in creating, designing, and programming software solutions for diverse industries and clients. Software developers refer to all software development team members. To define the sample size, the formula developed by Yamane (1967) with a 95% confidence level was applied. To define the sample size, the formula developed by Yamane (1967) was applied.

$$n = \frac{N}{1 + N(e)^2}$$

In this formula, the sampling deviation (e) is considered to be 0.05, representing a 95% level of precision.

$$, n = \frac{610}{1 + 610\ (0.05)^2} = 241.58 \approx 242$$

Thus, the sample size was 242 software developers, which represents about 40% of the total software developers in the selected companies. The resulting 242 respondents were allocated proportionately to each software development company. Based on the list provided by software companies, a total of 242 software developers were chosen by employing a random number generator.

Data Collection and Analysis

The list of selected respondents was sent to respective software companies through email to request participation in the online survey. All 242 software developers received questionnaires, and the entire sample was completed and returned, resulting in a response rate of 100%. This approach enhances the statistical validity and reliability of the study's results. Secondary data was collected from previous literature, official reports, and academic journals. Myanmar Computer Industry Association also provided data and information about software development companies.

The research utilised a structured questionnaire as its primary instrument, which consisted of questions presented in 5-point Likert scales. The Likert scale ranged from "1 = strongly disagree" to "5 = strongly agree". The questionnaire was divided into three sections. Section (A) focused on demographic inquiries such as gender, age, education, and service years at the current company. Section (B) asked the respondents about their leaders (in the questionnaire, the term "leader" specifically refers to the team leader or the individual who heads the team with whom the respondent is directly working). Items for measuring transactional leadership were taken from Mejia-Trejo et al. (2013), Podsakoff et al. (1990), and Tung (2016); those for transformational leadership were adopted from Mejia-Trejo et al. (2013); García-Morales et al. (2008); Tung (2016); and those for ambidextrous leadership were taken from Jansen et al. (2009); Tung (2016). The modified leadership scale consists of 20 items: 5 items for transactional leadership, 5 for transformational leadership and 10 for ambidextrous leadership. The section (C) asked the respondents about their self-efficacy and innovative work behaviour. Items for measuring the software developers' self-efficacy were drawn from previous studies (Downey & Kher, 2015; Dörner, 2012; Sun et al., 2019), which consist of 10 items. Furthermore, ten items for measuring innovative work behaviour were adopted from Dörner (2012) and Elidemir et al. (2020). The demographic characteristics of the respondents were illustrated using descriptive statistics. Additionally, a regression analysis was conducted to investigate the impact of leadership styles on self-efficacy and to explore the influence of self-efficacy on innovative work behaviours.

RESULTS AND DISCUSSIONS

Results

First of all, the demographic data of respondents was examined to ascertain the nature of respondents who participated in the survey from the software development companies. Out of 242 respondents, there were 164 males (67.8%) and 78 females (32.2%). The findings regarding gender show a clear majority of male respondents, with females representing a smaller percentage. Most of the respondents (36.8%) were between 21 and 25 years old, with the second-largest group (36.4%) falling within the 26 to 30 age range. The demographic group aged 31-35 years constituted the third-largest proportion (17.8%), whereas those aged 20 and under, as well as those aged 36 and above, represented the smallest proportions within the study sample. As ongoing learning is essential for competitiveness in the dynamic software sector, most participants hold at least a bachelor's degree, with IT-related education being prevalent. Employee experience is diverse, with a majority having less than or equal to 2 years, a notable group in the 2-4 years range, and a smaller portion with 8-10 years of service. Demographic factors are shown in Table 1.

Table 1. Demographic Characteristics of the Respondents

Items	Classification	Frequency	%
Gender	Male	164	67.8
	Female	78	32.2
Age (Year)	16-20	1	0.4
	21-25	88	36.4
	26-30	89	36.8
	31-35	43	17.8
	36-40	1	0.4
	41-45	15	6.2
	46-50	5	2.1
Education	Undergraduate	43	17.8
	Bachelor's Degree	156	64.5
	Master's Degree	37	15.3
	Doctoral Degree	-	-
	Others	6	2.4
The Service Years at the Current Company	≤2 years	114	47.1
	2-4 years	47	19.4
	4-6 years	30	12.4
	6-8 years	30	12.4
	8-10 years	6	2.5
	≥ 10 years	15	6.2
Total		242	100

Then, descriptive statistics of each of the variables were displayed in Table 2 by using the mean value of each of them. The mean values for all variables were classified into three levels of perception. According to Sekaran and Bougie (2016), a mean value lower than 2.00 indicates a perception at a low level. On the other hand, if the mean value falls between 2.00 and less than 3.50, it is considered a moderate level of perception. Lastly, a mean value equal to or greater than 3.50 is classified as a high level of perception. In terms of leadership styles, software developers' perception of the "ambidextrous leadership" style was quite high, having a 4.06 out of 5-point scale. "Transformational leadership" achieves a mean score of 3.95, indicating a positive perception of transformational leadership. The perception of "transactional leadership" receives a mean score of 3.93, indicating a notable preference for leadership behaviours that prioritize tasks. According to the survey data, the mean value of self-efficacy is 3.97, indicating a relatively high level of self-efficacy among respondents. It may inform the importance of maintaining and enhancing self-efficacy to further support developers in their roles. In addition, software developers, on average, view their innovative work behaviour favourably, with a mean score of 3.99, which suggests their willingness to participate in innovative ways of working. It highlights the supportive atmosphere in the organisation that helps encourage creativity and progress.

Table 2. Perception of Software Developers on Leadership Styles, Self-Efficacy, and Innovative Work Behaviour

Particular	Mean	Standard Deviation
Transactional Leadership	3.93	0.59
Transformational Leadership	3.95	0.63
Ambidextrous Leadership	4.06	0.68
Self-Efficacy	3.97	0.81

After this, reliability and validity tests were carried out to ensure the accuracy and reliability of the measurements for each construct. Cronbach's Alpha technique is widely employed to analyse reliability. This formula serves as the foundation for assessing reliability through internal consistency (Kim & Cha, 2002). In the present study, the internal consistency of the questionnaire's scales is evaluated using Cronbach's alpha value. When the alpha value is low, it indicates the presence of unreliable items, necessitating the identification of such items through an item analysis procedure. However, it is generally preferred for Cronbach's alpha value to be above 0.7, ensuring optimal reliability (Sekaran & Bougie, 2016). In this study, an assessment was conducted to determine the adequacy of the sampling. This assessment involved examining the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and performing Bartlett's test of sphericity. The KMO test revealed that all variables had values above 0.5, indicating that each variable possessed sufficient sampling adequacy (DeVellis, 2003; Nunnally, 1978; Shrestha,

2021). Furthermore, the results demonstrated that Cronbach's Alpha values for all variables exceeded the threshold of 0.7. This indicates strong internal consistency and reliability of the scale within the sample. The findings, including the KMO test results, are presented in Table 3.

Table 3. Reliability and Validity of the Variables

Variables	No. of Items	Reliability Cronbach's Alpha	Validity KMO	Validity Significance
Transactional Leadership	5	0.810	0.782	.000
Transformational Leadership	5	0.842	0.803	.000
Ambidextrous Leadership	10	0.953	0.692	.000
Self-Efficacy	10	0.969	0.798	.000
Innovative Work Behaviour	10	0.926	0.914	.000

For the first research objective of the study, multiple regression analysis was undertaken to find the effect of leadership styles on software developers' self-efficacy, and the result was displayed in Table 4.

Table 4. The Effect of Leadership Styles on Self-Efficacy

Independent Variables	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	VIF
	B	Std. Error	Beta			
Constant	-0.008	0.276		-0.028	0.978	
Transactional Leadership	0.448***	0.107	0.327	4.173	0.000	2.819
Transformational Leadership	0.064	0.098	0.050	0.648	0.517	2.688
Ambidextrous Leadership	0.484***	0.069	0.408	6.979	0.000	1.568
R			0.693			
R^2			0.480			
Adjusted R-square			0.473			
F- test			73.238***			

Statistically significant indicator *** at the 1% level

Table 4 reveals that both transactional and ambidextrous leadership styles have a significant effect on the self-efficacy of software developers, while transformational leadership does not. The regression coefficients (B) for transactional and ambidextrous leadership are 0.448 and 0.484, respectively, both with p-values of 0.000. The fitted model demonstrates an R-square value of 0.480, indicating the percentage of variability in the outcome variable accounted for by the model. Furthermore, the model's overall significance is supported by an F-statistic of 73.238. According to the findings, software development companies need to invest in leadership development programs that specifically target the development of self-efficacy.

In order to address the second research objective of the study, which aimed to investigate the effect of self-efficacy on the innovative work behaviour of software developers, a simple linear regression analysis was conducted; the findings of this analysis are presented in Table 5. The model fitness is acceptable with an R-square value of 0.398, F= 158.448. The self-efficacy of software developers was discovered to have a highly positive, significant impact on their

innovative work behaviour (B = 0.492, p = 0.000). Therefore, self-efficacy showed a positive and significant relationship with the innovative work behaviour of software developers. When software developers possess a higher level of self-efficacy, they have a higher chance of being involved in innovative activities.

Table 5. The Effect of Self-Efficacy on Innovative Work Behaviour

Independent Variables	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	VIF
	B	Std. Error	Beta			
Constant	2.035	0.158		12.856	0.000	
Self-Efficacy	0.492***	0.039	0.631	12.588	0.000	1.000
R			0.631			
R^2			0.398			
F-test			158.448***			

Statistically significant indicator *** at the 1% level

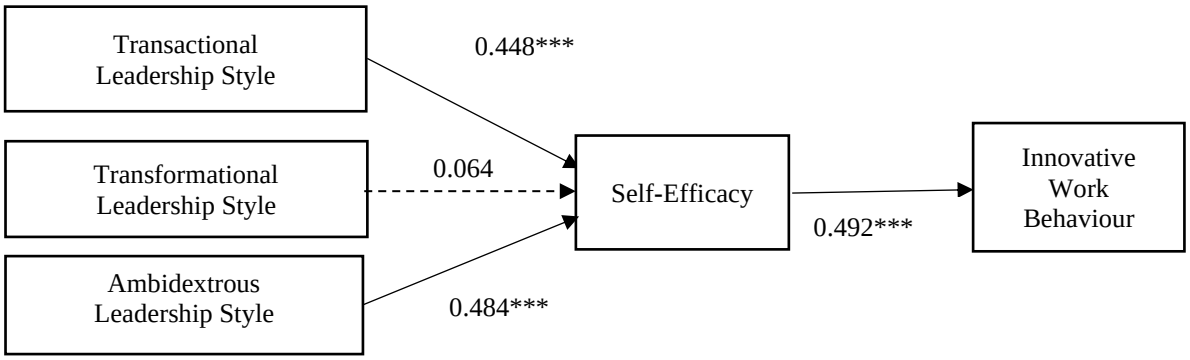
Table 6 shows the summary of the hypotheses. According to the results, the hypothesis (2) was not supported.

Table 6. Summary of the Results of Hypotheses Testing

Hypothesis	Description	Result
H_1	Transactional leadership has a positive relationship with self-efficacy.	Supported
H_2	Transformational leadership has a positive relationship with self-efficacy.	Not Supported
H_3	Ambidextrous leadership has a positive relationship with self-efficacy.	Supported
H_4	Self-efficacy has a positive relationship with innovative work behaviour.	Supported

Through testing the research hypotheses, three significant findings emerged, and one was found to be insignificant. The first significant finding is that transactional leadership is significantly correlated with self-efficacy, thereby supporting H_1. On the other hand, the second finding indicates that transformational leadership is not significantly correlated with self-efficacy, leading to the non-support of H_2. Furthermore, H_3 was supported by the finding of a significant association between ambidextrous leadership and self-efficacy. Lastly, H_4 was also supported through the identification of a significant relationship between self-efficacy and innovative work behaviour. Overall, these results confirm the influence of transactional and ambidextrous leadership on self-efficacy and the importance of self-efficacy on innovative work behaviour. It was observed that the effect of transformational leadership on employee self-efficacy was not significant. These findings underscore the critical role of transactional and ambidextrous leadership in shaping self-efficacy and fostering employee innovative work behaviour.

The summary results based on data analysis are shown in Figure 2. It summarises the relationships between variables included in the analysis.



Notes: ⟶ Significant ⇢ Insignificant

Figure 2. Summary of the Results

According to the summary of the results, self-efficacy is positively influenced by transactional and ambidextrous leadership styles. However, self-efficacy is not influenced by transformational leadership. Self-efficacy can influence the innovative work behaviour of software developers within the field of software development companies in Myanmar.

Discussions

Based on the analysis, major findings and discussions were described in this section. Firstly, descriptive statistics were examined to know software developers' perceptions of leadership styles, their self-efficacy, and innovative work behaviour. The study found that having a high mean score of ambidextrous leadership style and self-efficacy indicated that software developers working at the selected companies have a good perception of transactional, transformational, and ambidextrous leadership styles. According to the descriptive analysis, it was found that software developers have a favourable perception of their levels of self-efficacy and innovative work behaviour. Self-efficacy is a valuable indicator for organisations as the emotional and cognitive experiences of software developers promote innovative work behaviour that goes beyond their core job responsibilities. In addition, they view leadership styles (transactional, transformational, and ambidextrous) as relevant and important for their self-efficacy and innovative work behaviour. The results of this research indicate that software developers tend to prefer transactional leaders who provide clear guidelines and directions because their work is precise and predictable. This type of leadership helps create role clarity and task comprehension, which improves the self-efficacy of software developers. On the other hand, transformational leadership is positively perceived because it inspires and motivates teams, encourages innovation, and offers feedback and recognition, contributing to a sense of achievement and self-efficacy among software developers. Ambidextrous leadership is also

valued by software developers as it enhances their self-efficacy by promoting the exploration of new concepts and technologies, preparing them for challenges, and boosting their confidence in adaptability. The combination of exploratory and exploitative tasks keeps developers engaged, while feedback and recognition further strengthen their belief in their capabilities.

Results showed that software developers' self-efficacy has a positive, significant effect on innovative work behaviour. In fact, the self-efficacy of software developers depends on transactional and ambidextrous leadership styles. Interestingly, the transformational leadership style did not yield the same effect. It was observed that an ambidextrous leadership style was the most influential factor in enhancing self-efficacy. Its positive impact on software developers' self-efficacy is significant and helps bring about significant improvement.

According to the findings, transactional leadership can increase the self-efficacy of software developers by providing clarity, recognition, feedback, consistency, and stability. For example, when a leader excels at setting precise expectations and creating a structured and predictable work environment, it can foster developers' confidence in meeting those expectations and thus boost self-efficacy. In addition, if leaders utilise rewards and recognition effectively, they can motivate software developers to produce high-quality work and strengthen their self-efficacy. Thus, software developers tend to prefer transactional leaders who provide clear guidelines and directions due to the precise and predictable nature of their work.

The leadership style of ambidextrous was discovered to be the most influential factor in improving self-efficacy by promoting a balanced approach between exploration and exploitation. This enables software developers to actively participate in the innovation process while maintaining efficiency and productivity. The software team leader who exhibits ambidextrous skills can create an empowering environment that boosts the confidence and capabilities of individual software team members by encouraging continuous learning. Consequently, ambidextrous leadership is deemed superior to transactional leadership as it transcends traditional methods of performance rewards and static processes. By simultaneously focusing on day-to-day operations and long-term innovation, ambidexterity fosters flexibility, creativity, and adaptability, which are crucial for thriving in today's dynamic business landscape facing software development companies.

In contrast, the effect of transformational leadership on self-efficacy may not be significant in the context of software development. This may be mainly because software development relies heavily on technical expertise and clear processes, which can overshadow the impact of visionary and inspiring leadership styles. While transformational leadership can be effective in

other settings, its effectiveness may vary depending on the specific needs and circumstances of the software development sector.

In the Myanmar software development sector, there may be certain challenges to implementing transformational leadership and its impact on self-efficacy. It assumes that while transformational leadership can be effective in motivating and inspiring followers to believe in themselves and their abilities, not all individuals may thrive under this style of leadership. Some individuals may benefit more from other leadership styles, such as transactional or ambidextrous leadership, that focus more on setting clear goals, providing feedback, and offering support in a more structured and direct manner (Deng et al., 2019; Jiang et al., 2021). Therefore, the result highlights that these contextual factors need to be taken into account when assessing the potential impact of transformational leadership on self-efficacy in the Myanmar software sector.

As employee self-efficacy leads to innovative work behaviour, promoting it among software developers is beneficial for companies. When software developers have high levels of self-efficacy, they tend to have greater confidence in their abilities to generate innovative thought and creative solutions. This can lead to improved performance, increased productivity, and overall better outcomes for the company. This means that they are more capable of coming up with creative solutions, thinking outside the box, and generating novel ideas to advance their work and contribute to their organisation's success. Thus, by highlighting the relationship between self-efficacy and innovative work behaviour, the finding emphasises the importance of nurturing and cultivating developers' self-efficacy in their abilities.

As this study suggests, software development team leaders who combine the exploration of new opportunities with the utilisation of existing capabilities can potentially encourage and promote the self-efficacy of their software developers. This approach not only encourages innovation and enhances self-efficacy but also guarantees the industry's competitiveness and adaptability. This is because when software developers have a strong belief in their capabilities to excel at their tasks, they tend to take risks, think creatively, and come up with new and innovative solutions.

MANAGERIAL IMPLICATIONS IN THE SOUTH EAST ASIAN CONTEXT

In the Southeast Asian context, software development companies could prioritise investing in leadership development programs that focus on transactional and ambidextrous leadership styles over transformational leadership, as the formers are more effective for this industry. Managers in

software development companies could concentrate on refining skills such as goal-setting, feedback provision, and balancing exploration and exploitation to motivate and guide their teams towards success while encouraging innovation and adaptability. This tailored leadership development approach is crucial for navigating the dynamic and competitive landscape of the South East Asian software development industry.

Furthermore, in Southeast Asia, it is advantageous for software development companies to understand and adapt to the region's unique cultural nuances and dynamics by developing cross-cultural communication skills, promoting diversity and inclusion, and fostering a collaborative work environment that respects hierarchy and seniority. By developing culturally sensitive leadership competencies, companies can improve employee self-efficacy, innovative work behaviour, performance, and overall organisational success in Southeast Asia.

This effective leadership style not only fosters innovative thinking in employees but also boosts their confidence, performance, job satisfaction, and commitment, thereby enhancing the competitiveness of businesses amidst global competition or economic instability (Gojali et al., 2021). Given the emphasis on innovative work behaviour for creativity and gaining a competitive edge through innovation in the dynamic South East Asian region, these recommendations are applicable to all companies operating there.

Moreover, based on the findings, a key implication is that while transactional leadership is suitable for software development companies during transitions or when establishing clear protocols and procedures, it is important to combine it with transformational leadership in a dynamic and innovative environment. This combination of leadership styles, known as ambidextrous leadership, can drive exceptional outcomes. For instance, in waterfall projects, which involve a sequential development process with distinct phases, transactional leadership holds significance for software companies by focusing on clear expectations, progress monitoring, and rewarding or penalising based on performance. On the other hand, in agile projects, which embrace a flexible and iterative approach to development, it is crucial to integrate elements of transformational leadership by inspiring and motivating team members, fostering creativity and innovation, and promoting a collaborative and adaptive work environment. By fostering leaders who can seamlessly transition between these styles as the situation demands, a more adaptable and effective leadership culture can be instilled within software development companies.

According to the result, the self-efficacy of software developers does influence the cultivation of their innovative work behaviour so that organisations can strive to create a supportive and encouraging work environment. Additionally, leaders and supervisors can provide regular

feedback and recognition for innovative contributions. Recognising and rewarding developers' innovative efforts, not only boosts their confidence but also reinforces the importance of innovative work behaviour within the organisation. Moreover, it is crucial to promote collaboration and knowledge sharing among them. Besides, software developers can be encouraged to share their ideas and perspectives, as this can lead to the generation of unique and creative solutions. An important implication is that for software development companies can consistently evaluate and assess their existing systems and processes. This diligent practice allows them to identify and address any barriers or obstacles hindering innovative work behaviour. Identifying and removing these barriers creates a supportive environment where software developers feel empowered and encouraged to actively participate in innovative practices. Therefore, these managerial implications can assist software development companies in enhancing the self-efficacy and innovative work behaviour of software developers. Additionally, organisations continually progress and maintain their competitive advantages in terms of improving their overall performance and efficiency.

THEORETICAL IMPLICATIONS

The current research study has made remarkable progress in the existing scholarly field by emphasising the importance of self-efficacy in cultivating employees' innovative work behaviour. This finding is in line with the self-efficacy conceptual framework (Kanapathipillai et al., 2021; Zahra & Waheed, 2017). To enhance employee self-efficacy, Hughes et al. (2018) suggested utilising three leadership approaches: transactional, transformational, and ambidextrous leadership relating to enhancing self-efficacy. However, the study did not find evidence to support the idea that transformational leadership exerts influence on the self-efficacy of software developers. Surprisingly, the results showed that being under transformational leadership did not have a significant influence on self-efficacy. This unexpected finding contradicts previous research that suggested a positive relationship between transformational leadership and self-efficacy (Azim et al., 2019; Yulianto et al., 2021). The findings only support and add to the body of knowledge on transactional (Mehdinezhad & Mansouri, 2016; Safarudin et al., 2015; Turner et al., 1997). and ambidextrous leadership (Jiang et al., 2021; Tushman & O'Reilly, 1996), indicating that it can facilitate the promotion of self-efficacy of software developers. The study also emphasises the importance of these types of leadership in encouraging and enhancing self-efficacy in organisational settings, highlighting the concept of self-efficacy in boosting individuals' actions in the pursuit of innovative work (Bandura, 1986).

This study underscores the significance of recognising and addressing challenges and unexpected outcomes in research. It acknowledges that research results may not always match established theories and expectations. Overall, these findings suggest that the effect of transformational leadership on self-efficacy might not be as influential as commonly assumed, emphasising the importance of remaining open to new insights and conducting thorough research to achieve a deeper understanding of the subject matter.

On the other hand, it is crucial to recognise that this study has its limitations. The research only focused on four software development companies in Myanmar, which may restrict the broad applicability of the results. Furthermore, the study solely assessed innovative work behaviour at the individual level and did not investigate group or organisational levels. To address these limitations, future studies could adopt a more comprehensive approach. For example, a larger sample size from diverse industries in Southeast Asia could be included to improve the applicability of the findings. Exploring the effects of leadership styles and self-efficacy on group and organisational behaviour could provide a more holistic understanding.

In terms of recommendation, the study suggests that while transactional leadership is effective for establishing protocols in software companies, integrating it with transformational leadership in a dynamic environment is crucial for optimal outcomes. Combining these leadership styles can lead to exceptional results. It also recommends fostering innovation among developers by promoting self-efficacy and creating a supportive work environment. Additionally, the study proposes that providing regular feedback and recognition, encouraging collaboration, and evaluating existing processes are essential strategies for fostering innovative work behaviour within software development companies.

However, further investigation is needed to explore certain aspects. Future research could explore the specific skills and competencies necessary for successful leadership development, as well as methods for assessing the effectiveness of such programs and their lasting impact on organisational performance. Additionally, examining approaches to implementing mentoring and training programs that bolster self-efficacy in software developers could prove valuable. Furthermore, exploring how leadership affects team dynamics and collaboration in software development companies can help identify ways to build strong, successful teams. Conducting additional research in these areas would enhance the understanding of establishing effective leadership cultures in these companies, resulting in enhanced self-efficacy, innovative work behaviour, and overall performance.

CONCLUSION

This study makes a valuable contribution to the software development industry by shedding light on the relationship between leadership styles, self-efficacy, and innovative behaviour among software developers. The findings from this research can raise awareness among software development teams, project managers, and organisational leaders about the importance of creating an environment of positivity that supports self-efficacy and encourages innovative thinking. It emphasises that leadership styles play a crucial role in shaping developers' self-belief in their skills and capabilities and ultimately influencing their innovative work behaviour. Moreover, the study suggests that a comprehensive approach is necessary, as simply focusing on leadership alone is not sufficient. It is crucial to consider the supporting factors and industry-wide initiatives such as mentorship programs, training opportunities, and collaboration among team members to enhance developers' self-efficacy, promote innovative behaviour, and drive overall performance in the software development field. Such insights can guide organisations and industry professionals in creating a conducive work culture that fosters continuous growth, creativity, and success in software development endeavours.

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Appendix

PART (A)

QUESTIONNAIRES FOR SOFTWARE DEVELOPERS

PROFILE OF THE SOFTWARE DEVELOPER

1. **Gender**

Male ☐

Female ☐

2. **AGE (CATEGORY)**

16-20 ☐

21-25 ☐

26-30 ☐

31-35 ☐

36-40 ☐

41-45 ☐

46-50 ☐

3. **EDUCATION**

◊ Undergraduate ☐

◊ Graduate/ Bachelor's Degree ☐

◊ Master's Degree ☐

◊ Doctor's Degree ☐

◊ Other (e.g., IT certifications */IT Training or I*T Diploma) ☐

4. **CURRENT SERVICE YEARS IN THIS COMPANY**

◊ ≤ 2 years (Less than or equal 2) ☐

◊ 2-4 years ☐

◊ 4- 6 years ☐

◊ 6-8 years ☐

◊ 8-10 years ☐

◊ ≥10 years ☐

PART (B)
INDEPENDENT VARIABLES

PLEASE ANSWER ALL THE QUESTIONS BY CIRCLING THE NUMBER WHICH BEST REPRESENT YOUR CHOICE.

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

1. Leadership Styles

The leader referred to in this questionnaire means the team leader or head of the team with whom he/she is working directly.

Transactional Leadership

	Statement	1	2	3	4	5
1.	Our leader always gives me positive feedback when I perform well.					
2.	Our leader gives me special recognition when my work is very good.					
3.	Our leader commends me when I do a better than average job.					
4.	Our leader personally compliments me when I do outstanding work.					
5.	Our leader often fails to recognize or acknowledge my positive performance.					

Transformational Leadership

	Statement	1	2	3	4	5
1	Our leader is always on the lookout for new opportunities for the unit/department/ organization.					
2	Our leader has a clear common view of its final aims.					
3.	Our leader succeeds in motivating the rest of the company.					
4.	Our leader always acts as the organization's leading force.					
5.	Our leader has leaders who are capable of motivating and guiding their colleagues on the job (masters).					

Ambidextrous Leadership

	Statement	1	2	3	4	5
1.	Our leader encourages us to accept demands beyond existing products and services.					
2.	Our leader fosters innovation by driving the invention of new products and services.					
3.	Our leader promotes experimentation with new products and services in our local market.					
4.	Our leader leads the commercialization of completely new products and services.					
5.	Our leader actively explores and capitalizes on new opportunities in new markets.					
6.	Our leader emphasizes frequent refinement of existing products and services.					
7.	Our leader promotes continuous improvement for products and services.					
8.	Our leader introduces improved versions of existing products and services for our local market.					
9.	Our leader drives efforts to increase economies of scale in existing markets.					
10.	Our leader prioritizes the objective of lowering costs of internal processes.					

PART (C)

DEPENDENT VARIABLE

PLEASE ANSWER ALL THE QUESTIONS BY CIRCLING THE NUMBER WHICH BEST REPRESENT YOUR CHOICE.

1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree

1. Self-Efficacy

	Statement	1	2	3	4	5
1.	I have confidence in my ability to create into innovative ideas.					
2.	I have confidence in my ability to solve problems.					
3.	I have a talent for further developing the ideas of others.					
4.	I have a talent for making others enthusiastic for new ideas.					
5.	I have confidence in my ability to convince others of the benefit of new ideas.					
6.	I have the social contacts needed to find backers for realizing new ideas.					
7.	I have confidence in my ability to implement new methods at work.					
8.	I am keen on exploring new technologies to enhance my skill set.					
9.	I have confidence in my ability to adapt to new methods at work.					
10.	I am dedicated to continually improving my proficiency in using the tools for optimal results.					

2. Innovative Work Behaviour

	Statement	1	2	3	4	5
1.	I promote and champion ideas to others.					
2.	I attempt to convince people to support an innovative idea.					
3.	I advocate innovative technologies and practices within the organization.					
4.	I systematically introduce innovative ideas into work practices.					
5.	I inspire key stakeholders within the organization to embrace innovative ideas.					
6.	I contribute to the implementation of new ideas.					
7.	I suggest new ways to achieve goals and objectives.					
8.	I exhibit creativity on the job when given the opportunity.					
9.	I develop adequate plans and schedules for the implementation of new ideas.					
10.	I collaborate for successful implementation of new ideas and features.					

"Thank you very much for your understanding and patient response"