Ekoloji 27(106): 771-777 (2018)

A Study of the Effects of Leadership Styles on Innovation Management and Organizational Innovation in Environmental Protection Industry

Yi Lin [1*], Jin Wu [1]

[1] Business School, Nanfang College of Sun Yat-Sen University, Guangzhou, CHINA

[*] Corresponding author: moniquelin@126.com

Abstract

Environmental protection industry covers prevent environmental pollution, improve the ecological environment, and protect natural resources to diversify the business marketing channels. It is necessary to utilize teamwork as the management model for sharing and fully using resources. Under the cross-industry business, traditional marketing is impacted and the market becomes more competitive. Salespeople in traditional Environmental protection industry could maintain the market by learning and enhancing personal service quality. The competence of a business supervisor is the key in the excellence of the team. The major characteristic of Environmental protection industry is talent oriented, unlike traditional manufacturing with plenty of production machines and production lines. The major issue for Environmental protection industry therefore is to enrich industrial talents. As the example of environmental protection industry in Guangdong, the effect of leadership styles on innovation management and organizational innovation is discussed. With quantitative questionnaire survey, data required for this study are collected and analyzed with statistics for the conclusion and suggestion. The research results reveal that leadership styles could coherence to the unit and induce employees involving in the work with continuous innovative ability to achieve organizational innovation; and, leadership styles could affect the operation of innovation management, which could induce employees to work hard.

Keywords: leadership style, innovation management, organizational innovation, environmental protection industry

Lin Y, Wu J (2018) A Study of the Effects of Leadership Styles on Innovation Management and Organizational Innovation in Environmental Protection Industry. Ekoloji 27(106): 771-777.

INTRODUCTION

The key factors in the sustainable management and success of an environmental protection company lie in the quality of internal employees. environmental protection industry is the human-oriented service industry, without machining processes, and all sales rely on people. Since the openness of free market in environmental protection industry, salespeople registering in environmental protection companies are increasing and environmental protection products become diversified along with the environmental protection reform. The fierce competition of environmental protection market also shortens the life of environmental protection products. The marketing has changed from traditional one-to-one visit to TV advertisement, network, and e-mail collective marketing; the sales channels appear diversification. Environmental protection industry covers prevent environmental pollution, improve the ecological environment, and protect natural resources that the business marketing channels are diverse and the business models require teamwork management so as to thoroughly share and use resources. Under cross-industry, traditional marketing is largely impacted. environmental protection businesses carve up customers to result in stricter market competition. Traditional environmental protection salespeople could keep the market through learning and enhancement of personal service quality. It explains the importance of human resources. The environmental protection industry is human-oriented businesses in which either internal employees or external customers are based on people. Competency development is an indicator for an enterprise evaluating the managers. When a supervisor could not enhance the competency, the team would not be competitive, including the retention and cultivation of personnel, customer satisfaction, and policy renewal. The competency of basic-level supervisors is the key factor in the quality of a team. The major characteristic of Environmental protection industry is talent-orientation. Unlike traditional manufacturing with numerous production machines and production lines,

 Received: 30 Jun 2017 / Accepted: 25 Sep 2018

the major issue of Environmental protection industry is to enrich the talents. For this reason, an environmental protection company would include competency into the evaluation, promotion, and pay of a supervisor. This study aims to discuss the effect of leadership styles on innovation management and organizational innovation in Environmental Protection Industry.

LITERATURE REVIEW

Leadership Styles

In the research on organizational communication, incentive systems, and leadership styles to organizational commitment, Barlatier and Dupouët (2015) considered that leadership styles would change with situational conditions, and leadership behaviors and the effect would also change. Leadership styles therefore were defined as a leader definitely making organizational objectives, leading organizational members to do "right" things, and having employees automatically strive for organizational objectives. Dartey-Baah (2015) stated that a leader, according to organizational policies, would outline the vision and establish objectives and development directions, and, based on the position and power, would guide organizational members to effectively apply resources, through the tactics of communication, command, coordination, and systems as well as the functions of encouragement, incentives, and influence, to achieve the preset objectives of the organization. Adinoyi et al. (2014) indicated that leadership styles combined personality and time development and were affected by organization-related situations. Hansen et al. (2017) considered that leadership styles mainly covered the development of influence, advocacy behaviors, enhancement of cooperation, authority of trust, and movement to achieve organizational objectives.

Referring to Chang and Teng (2017), leadership styles contain three theories of democratic, authoritarian, and Laissez-faire.

(1) **Democratic leadership:** Major policies are discussed and determined through groups. With group discussion, people would understand and grasp the content and steps. The work is assigned through the team, and leaders adopt the attitudes of encouragement and assistance and evaluate the work with objective standards (Salanova et al., 2015).

(2) **Authoritarian leadership:** All policies are determined by leaders, and subordinates would follow orders, without participating in discussions or providing opinions.

(3) **Laissez-faire leadership:** Workers or groups have the complete decision-making power, while leaders would not participate in the decisions. A leader is simply responsible for providing information required for other personnel, while individuals would take charge in the work.

Innovation Management

Robbins and Judge (2015) pointed out innovation management as scientific research plans achieving the expected goal through planning, management by objectives, environmental judgment, coordination, integration, and schedule control. Barrientos and Reilly (2016) indicated that the environment related to an enterprise often changed in the product innovation process. The external environment, containing consumer behavior, supplier capability, competitor strategy, market economic activity, government policy, and technology change (Jamielniak et al. 2015), would affect the innovation activity of an enterprise. The internal environment, on the other hand, covering individual value of innovation, learning ability of team creativity, and cross-section coordination and integration, would also serious influence the innovation activity of an enterprise. Accordingly, Arena et al. (2015) regarded innovation management as the management activity for innovation individuals, teams, organizations, and external environment. Garaus et al. (2016) argued that the management of individuals, teams, and organizations was the focus of innovation management as well as the key success factors in innovation management.

Referring to Tsai (2016), three dimensions are proposed in this study for innovation management.

(1) **Morale management:** Work performance is the major factor in personnel morale being encouraged.

(2) **Management by objectives:** It is the management philosophy and management skill utilizing upper- and lower-level supervisor meetings for self-setting important working objectives, self-controlling schedule, and self-evaluating performance as well as providing employee satisfaction after completing tasks.

(3) **Interface management:** Effective interface control among R&D, manufacturing, and

marketing could improve the quality and speed of new product research and development.

Organizational Innovation

The use of methods or contents different from those used in the past in an organization is organizational innovation (Habaradas and Aure 2016). Nieves and Segarra-Ciprés (2015) referred innovation as increasing products, changing process, and developing new markets and new marketing methods. Bailey (2016) regarded organizational innovation as the process to achieve organizational objectives, including the generation, evaluation, and promotion of new concepts; innovation was a challenge of stagnant state to conform to or exceed the corporate objectives. Johnston & Marshall (2016) applied multiple points of view to define organizational innovation, including "technological innovation" and "management innovation". "Technological innovation" contained the use of existing technology or the creation of new technology to lead the product innovation or process innovation. "Management innovation" was the utilization of new management or system operation of an organization. Baškarada and Watson (2017) indicated that creating value to change an organization with existing resources could be organizational innovation.

Referring to Chen and Hou (2016), dual-core model is used for exploring the type of organizational innovation that "management innovation" and "technological innovation" are derived for innovation.

(1) Management innovation refers to the existing planning, organization, recruitment, leadership, and control, which are purchased externally or generated internally, of an organization being affirmed by the organizational members.

(2) Technological innovation refers to the existing equipment, process, and products, which are purchased externally or generated internally, of an organization being affirmed by the organizational members.

Research Hypothesis

Zheng et al. (2016) mentioned that people participating in innovation activity in an enterprise could be called knowledge workers; to enhance such people's innovation ability, fundamental problems should be taken into account; and, high-level supervisors should deeply realize and support innovation management. Mirić and Krstić (2017) indicated that high-level supervisors should apply innovative human resource strategies based on the development of mind model, with encourage innovation as the tactic, and with the innovation aiming at the accumulation of creativity so as to positively assist in the generation and accumulation of the innovation management of the organization. O'Connor et al. (2015) stated that high-level supervisors proceeding proper and effective innovation management in the innovation activity process to solve organizational inertia and eliminate obstacles to the development of innovation in the organization was regarded as an essential tactic and could properly affect the generation or accumulation of organizational innovation in the innovation activity (Salanova et al. 2015). Accordingly, the following hypothesis is proposed in this study.

H1: Leadership style would affect innovation management.

Woodman (2016) discovered three factors in innovation, including individual, organization, and environment. By organizing various studies, Robbins and Coulter (2017) proposed four positive factors in innovation, in which organic structure could help innovation, leaders' service term and leadership styles were correlated with innovation, rich organizational resources were the basis of innovation, and good communication among units could benefit organizational innovation. Mook et al. (2015) found out the correlations between leadership styles and organizational innovation. In the research on the relationship among leadership styles, organizational culture, and organizational innovation, Chang and Teng (2017) found out the positive effect of leadership styles on organizational innovation. For this reason, the following hypothesis is proposed in this study.

H2: Leadership style would influence organizational innovation.

Tsai (2016) considered that the operation method of innovation management would determine the capability of an organization and have the organization generate competitive advantages. Embedding innovation management in organization regulations contained ordinary decision-making process in an organization, organizational operation process, and organizational members' general behaviors. As the daily operation in an organization could not be easily found and imitated, it could form unique competitive advantages of the organization (Newth 2016). It was advocated that "people" were the basic element of the development of innovation management and the formation of innovative power of an enterprise. When the innovation management appeared on research and

Table 1. Analysis of variance of leadership style to innovation management

variable		F	P	Scheffe post-hoc
leadership style	morale management	10.431	0.000**	democratic(4.38)>Laissez-faire(3.82)>authoritarian(3.35)
	management by objectives	8.442	0.003**	authoritarian(4.04)>democratic(3.76)、Laissez-faire(3.47)
	interface management	9.153	0.000**	democratic(4.23)>authoritarian(3.91)>Laissez-faire(3.68)

Note: * stands for $p<0.05$, ** for $p<0.01$

development, "R&D personnel" was the fundamental element. Since innovation could not be managed (Robbins and Judge 2016), an enterprise precisely planning, executing, and controlling the work in the innovation management process was the emphasis on strategic planning to reduce the effect of control (Chen and Hou 2016). In this case, the following hypotheses are proposed in this study.

H3: Innovation management shows significantly positive effects on management innovation in organizational innovation.

H4: Innovation management presents remarkably positive effects on technological innovation in organizational innovation.

RESEARCH METHOD

Measurement of Research Variable

Innovation management

Referring to Tsai (2016), innovation management contains three dimensions of (1) morale management, (2) management by objectives, and (3) interface management.

Organizational innovation

Referring to Chen and Hou (2016), it covers (1) management innovation and (2) technological innovation.

Research Object and Sampling Data

Taking Environmental protection industry as the research object, the company of environmental Protection personnel in Guangdong are surveyed in this study. Total 238 valid copies of questionnaire are retrieved, with the retrieval rate 79%. Each retrieved questionnaire is regarded as a valid sample. The retrieved copies are analyzed the data with SPSS, and factor analysis, reliability analysis, regression analysis, and analysis of variance are applied to test various hypotheses.

Analysis Method

Analysis of variance is utilized in this study for discussing the difference of leadership styles in innovation management and organizational innovation; and, regression analysis is further used for understanding the relationship between innovation management and organizational innovation.

ANALYSIS RESULT

Reliability and Validity Analysis

With factor analysis, innovation management is extracted three factors of "morale management" (eigenvalue=2.155, α=0.84), "management by objectives" (eigenvalue=1.837, α=0.81), and "interface management" (eigenvalue=1.526, α=0.80). The accumulative covariance explained reaches 74.335%.

Organizational innovation, with factor analysis, is extracted two factors of "management innovation" (eigenvalue=2.664, α=0.88) and "technological innovation" (eigenvalue=2.371, α=0.86). The accumulative covariance explained achieves 78.423%.

Effects of Leadership Style on Innovation Management and Organizational Innovation

Analysis of variance of leadership style to innovation management

Analysis of variance is applied to discuss the difference of leadership styles in innovation management, i.e. to analyze and explain leadership styles of democratic leadership, authoritarian leadership, and Laissez-faire leadership. **Table 1** reveals that leadership styles appear significant differences in morale management, where democratic leadership (4.38) shows higher morale management than Laissez-faire leadership (3.82) and authoritarian leadership (3.35). Different leadership styles also present remarkable differences in management by objectives, where authoritarian leadership (4.04) shows higher management by objectives than democratic leadership (3.76) and Laissez-faire leadership (3.47). Finally, leadership styles reveal notable differences in interface management, where democratic leadership (4.23) appears higher interface management than authoritarian leadership (3.91) and Laissez-faire leadership (3.68).

Analysis of variance of leadership style to organizational innovation

Analysis of variance is utilized for discussing the difference of leadership styles in organizational innovation, i.e. to analyze and explain democratic leadership, authoritarian leadership, and Laissez-faire

Table 2. Analysis of variance of leadership style to organizational innovation

variable		F	P	Scheffe post-hoc
leadership style	management innovation	11.732	0.000**	authoritarian(4.16)>democratic(3.75)>Laissez-faire(3.51)
	technological innovation	13.838	0.000**	democratic(4.31)>Laissez-faire(3.80)>authoritarian(3.44)

Note: * stands for $p<0.05$, ** for $p<0.01$

Table 3. Analysis of innovation management to organizational innovation

dependent variable →	organizational innovation			
independent variable ↓	management innovation		technological innovation	
innovation management	β	Beta	β	Beta
morale management	2.138**	0.202	2.086**	0.196
management by objectives	2.233**	0.214	2.316**	0.227
interface management	2.027**	0.191	1.948*	0.183
F	24.631		27.159	
significance	0.000***		0.000***	
R2	0.235		0.262	
Adjusted R2	0.201		0.227	

Note: * stands for $p<0.05$, ** for $p<0.01$.
Data source: self-organized in this study

leadership. In **Table 2**, leadership styles show remarkable differences in management innovation, where authoritarian leadership (4.16) reveals higher management innovation than democratic leadership (3.75) and Laissez-faire leadership (3.51). Various leadership styles present notable differences in technological innovation, where democratic leadership (4.31) appears higher technological innovation than Laissez-faire leadership (3.80) and authoritarian leadership (3.44).

Correlation Analysis of Innovation Management and Organizational Innovation

Correlation analysis of innovation management and management innovation

To test H3, the analysis results, **Table 3**, reveal significant effects of morale management (β=2.138**), management by objectives (β=2.233**), and interface management (β=2.027**) on management innovation that H3 is supported.

Correlation analysis of innovation management and technological innovation

To test H4, the analysis results, **Table 3**, show remarkable effects of morale management (β=2.086**), management by objectives (β=2.316**), and interface management (β=1.948*) on technological innovation that H4 is supported.

CONCLUSION

The research results show that leadership styles indeed would significantly affect innovation management in Environmental Protection Industry. Supervisors with distinct experience, working environment, and company culture would apply different leadership styles. Even the same supervisor faces different leaders at the same phase would present distinct leadership styles. Apparently, there is not an application of leadership styles. A good leader would take different leadership styles to cope with distinct occasions, time, and objects. For instance, in the initial establishment of a team, the members, due to the lack of experiences and cooperation experiences, are not easily integrated. A leader could apply "authoritarian leadership" as the bridge for organizational members to timely allocate manpower and distribute work with the past experiences to reduce errors. During the development of the team, the organizational operation would become mature and the interaction is getting active. A leader then could use different leadership styles, according to the nature of the organization. By the end of the development, when the team is stably operated, a high-level supervisor, based on "democratic leadership", could empower the cadres to manage the basic-level affairs. Meanwhile, a leader's self-reflection and management is also important. The obedience and affection of subordinates could be used as the indicators for self-evaluation of leadership effectiveness. It should be avoided to apply authoritarian leadership to subordinates for long period and the establishment of affection with organizational members should be appropriate. Keeping a supervisor's authority and timely adjusting the leadership styles to enhance the leadership effectiveness could smoothly lead the team to achieve the project objectives.

SUGGESTION

Aiming at above research results, the following suggestions are proposed in this study.

1. The ultimate objective of leadership is to enhance work performance and outcome

performance in an organization. To enhance leadership effectiveness, a supervisor in environmental protection industry should apply more than one leadership style and change proper leadership styles according to the development phases and objectives of the organization to induce employees' potential and achieve the organizational objectives.

2. An environmental protection business should stress on building innovative corporate culture by creating innovative climate and encouraging the development of innovation activity. To have existing personnel and new recruits highly agree with the company's competitive advantage, it is based on continuous and successful innovation activity to have employees appear trust and loyalty and largely reduce the distrust and boycott of other departments to innovation management.

3. Supervisors in Environmental protection industry should positively participate in innovation management activity and actively provide any essential assistance. To enhance employees' value commitment, effort commitment, and retention commitment, a company has to encourage the employees coming up with and testing creativity and highly tolerating the attempt of errors. Such behaviors could generate extra innovation ability of the organization and could benefit accumulating such ability to become the continuous competitive advantage.

REFERENCES

Adinoyi YM, Ernawati MK, Yusof NA (2014) Influences of Firm Size, Age and Sector on Innovation Behavior of Construction Consultancy Services Organizations in Developing Countries. Business Management Dynamics, 4(4): 1–9.

Arena M, Azzone G, Bengo I (2015) Performance measurement for social enterprises. VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations, 26(2): 649-672.

Bailey JR (2016) The Difference between Good Leaders and Great Ones. Harvard Business Review.

Barlatier PJ, Dupouët O (2015) Achieving contextual ambidexterity with communities of practice at GDF SUEZ. Global Business and Organizational Excellence, 34(3): 43-53.

Barrientos E, Reilly AH (2016) Unpacking "Give Back Box:": A Social Enterpriseat the Intersection of Leadership, Innovation, and Sustainability. Journal of technology management & innovation, 11(1): 48-54.

Baškarada S, Watson J (2017) Managing the exploitation-exploration tradeoff: how leaders balance incremental and discontinuous innovation. Development and Learning in Organizations: An International Journal, 31(4): 13-16.

Chang JH, Teng CC (2017) Intrinsic or extrinsic motivations for hospitality employees' creativity: The moderating role of organization-level regulatory focus. International Journal of Hospitality Management, 60: 133-141.

Chen ASY, Hou YH (2016) The effects of ethical leadership, voice behavior and climates for innovation on creativity: A moderated mediation examination. The Leadership Quarterly, 27(1): 1-13.

Dartey-Baah K (2015) Resilient leadership: A transformational-transactional leadership mix. Journal of Global Responsibility, 6(1): 99-112.

Garaus C, Güttel WH, Konlechner S, Koprax I, Lackner H, Link K, Müller B (2016) Bridging knowledge in ambidextrous HRM systems: Empirical evidence from hidden champions. The International Journal of Human Resource Management, 27(3): 355-381.

Habaradas RB, Aure PAH (2016) Managing social enterprises in the Philippines: Challenges and strategies. Journal of Legal, Ethical and Regulatory Issues, 19(2): 39.

Hansen NK, Güttel WH, Swart J (2017) HRM in dynamic environments: Exploitative, exploratory, and ambidextrous HR architectures. The International Journal of Human Resource Management (in press): 1-32.

Jamielniak D, Latusek-Jurczak D, Prystupa K (2015) Klasykateoriizarządzania. Warszawa. Poland: WydawnictwoPoltext.

Johnston MW, Marshall GW (2016) Sales force management: Leadership, innovation, technology. Routledge.

Mirić AA, Krstić G (2017) Social Enterprises in Serbia: Analysis of Key Development Factors, Major Actors and their Relationships. Management: Journalof Sustainable Business and Management Solutions in Emerging Economies, 21(81): 47-57.

Mook L, Chan A, Kershaw D (2015) Measuring Social Enterprise Value Creation. Nonprofit Management and Leadership, 26(2): 189-207.

Newth J (2016) Social Enterprise Innovation in Context: Stakeholder Influence through Contestation. Entrepreneurship Research Journal, 6(4): 369-399.

Nieves J, Segarra-Ciprés M (2015) Management innovation in the hotel industry. Tourism Management, 46: 51-58.

O''Connor A, Du K, Roos G (2015) The intellectual capital needs of a transitioning economy: a case study exploration of Australian sectoral changes. Journal of Intellectual Capital, 16(3): 466-489.

Robbins SP, Coulter M (2017) Management (14th Ed). NJ: Pearson Prentice Hall.

Robbins SP, Judge TA (2015) Organizational Behavior (14th ed.). NJ: Prentice-Hall.

Robbins SP, Judge TA (2016) Organizational behavior (17th Ed.). NJ: Pearson Prentice Hall.

Salanova M, Lorente L, Chambel MJ, Martinez IM (2015) Linking transformational leadership to nurses' extra-role performance: The mediating role of self-efficacy and work engagement. Journal of Advanced Nursing, 67(10): 2256-2266.

Tsai C-J (2016) Exploring the Problem Solving of Aurora Social Enterprise: An Application of Business Model Canvas.

Woodman T (2016) The leader ship is sinking: A temporal investigation of narcissistic leadership. Journal of Personality, 84(2): 237-247.

Zheng X, Liu Z, Gong X (2016) Why does leader attention scope matter for innovation ambidexterity? The mediating role of transformational leadership. Leadership & Organization Development Journal, 37(7): 912-935.