

LOGISTICS COMPANY GOVERNANCE IN THE IMPROVEMENT OF LAST-MILE DELIVERY EFFICIENCY

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Abstract

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Last-mile delivery is the final step in the process of providing logistics transportation services. Viettel Post's last-mile delivery rate is lower than that of its direct competitors. With the goal of improving efficiency in last-mile delivery activities of logistics companies in general and Viettel Post company in particular. In this study, the author uses the logistics quality (LSQ) framework (Hartline & Ferrell, 1996) and the motivation-opportunity-ability (MOA) model framework (MacInnis et al., 1991) as the foundation theory to clarify the influence of delivery staff's own factors in the delivery staff's performance and to improve last-mile delivery efficiency. The data sample was collected online from 295 delivery staff working at Viettel Post company, in the period from November 2023 to March 2024. Using quantitative research on the partial least squares structural equation modeling (PLS-SEM) linear structural model on the Statistical Package for the Social Sciences (SPSS) v. 20 and AMOS v. 20 software, the results showed that five influential factors were identified, including: 1) knowledge of employees (KNO), 2) employee skills (SKI), 3) employee income (INC), 4) job characteristics (JOB), and 5) company reputation (REP). Based on research, the study provides recommendations for Viettel Post company managers as well as for logistics companies to improve last-mile delivery efficiency.

Keywords: Ability of Delivery Staff, Motivation of Delivery Staff, Opportunities for Efficiency of Delivery Staff, Company Reputation, Delivery Staff Income

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1. INTRODUCTION

The importance of logistics to the Vietnamese economy has been clearly recognized. As the economy expands towards a more competitive global landscape, there is an increasing need for human resources (HR) to manage logistics systems and supply chains more effectively, improving competitiveness. Companies have seen a shortage of HR in this field. Meanwhile, university training in logistics has lagged behind the industry's needs. Vietnamese universities do not provide enough quantity and quality of HR to meet the requirements

of logistics companies. Currently, the logistics industry is achieving a rapid transformation from the traditional model to a modern model (Ministry of Industry and Trade, 2023). The strong growth of e-commerce has created last-mile delivery problems for logistics service providers. The last mile is the delivery from the nearest distribution center to the customer. Last-mile delivery is the final step in the transportation service provision process. The rapid increase in parcel volume has exacerbated the labor shortage of experienced delivery staff. The last-mile delivery process is inefficient because it requires multiple deliveries or order returns when

the customer is not home. Logistics companies have identified last-mile delivery service as the main differentiator, the key to the logistics process. In fact, the variety of delivery options and the quality of delivery services are perceived as decisive criteria for customers and thus influence the success of the logistics company. Logistics companies are working hard to deliver a good customer experience, especially by improving delivery times and increasing successful last-mile delivery rates.

Over the past decade, researchers have delved into the analysis of factors that affect employee performance at work, such as the view that logistics service employees need to have knowledge and skills, awareness of identifying risks (Mismar, 2020), or does the demographic factor of gender affect employee abilities (ABI) (Edgar et al., 2021). Nguyen and Zelickson (2022) again consider the quality ethics of delivery staff. The reliability factor of the delivery staff itself affects delivery efficiency (Zhong et al., 2022). Motivational factors of workers (Pinder, 2008; de Stefano, 2015) such as working conditions and prices of delivery staff are motivations that also affect the last-mile delivery rate (Pourrahmani & Jaller, 2021). Delivery companies need to improve the quality of work and life of delivery staff (Puram et al., 2021). Technology will increase the motivation of delivery staff (Garus et al., 2022) or the workload will reduce the motivation of delivery staff (Lindqvist et al., 2022; Pourrahmani & Jaller, 2021).

In Vietnam, nearly one million parcels per day are delivered by Viettel Post (Ministry of Industry and Trade, 2023). Viettel Post also marked a change in strategy, a change in the strong application of information technology in management, operations, business activities, and customer-centric psychology, focusing on customer experience, allowing consumers to receive parcels the way they want, diversify payment methods, and enhance risk management. Belonging to the leading group of businesses in the last-mile delivery segment, in 2022 alone, the company has invested in 100 local warehouses that apply automatic technology to operate and monitor warehouse selection. Shorten the total delivery time by 30%-40% compared to before, using the Smart Locker solution that allows customers to pick up and return the goods at the nearest address without going through the postman. Use electric vehicles to replace gasoline vehicles, have the ability to penetrate densely populated areas, have a high rate of online purchases, use recycled materials to wrap goods, limit plastic, and install solar power. God blesses the distribution warehouse system to reduce dependence on the national power grid, cool the factory, and save electricity. As a result, the successful delivery rate of traditional mail reached 99%, and the average e-commerce mail reached 90%.

In the context of a booming economy, Vietnam's accession to the World Trade Organization (WTO), and the development of e-commerce, there is fierce competition on price and service quality among shipping units, as evidenced by the shipping rates. The successful delivery of many logistics companies

is slightly better than Viettel Post. Because customer preferences are becoming more and more demanding, Viettel Post needs to leave a strong mark in the eyes of customers. Service quality and HR are core requirements (Mentzer et al., 2001).

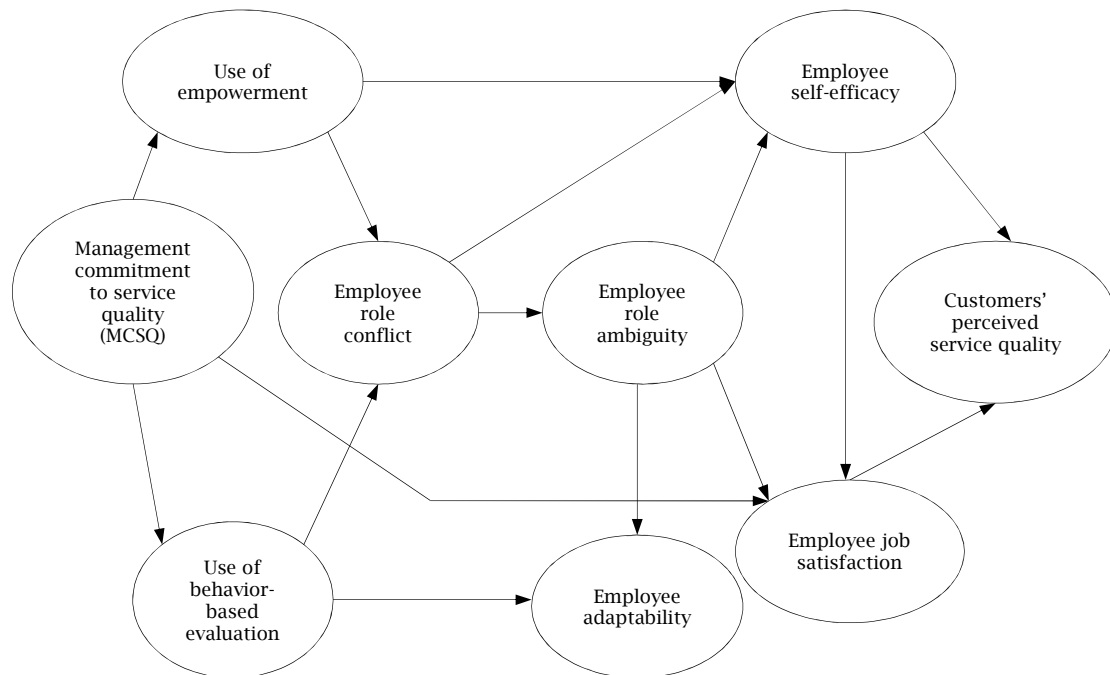
Currently, scientists around the world mostly accept the logistic quality (LSQ) framework proposed by the authors (Hartline & Ferrell, 1996) when considering the factors that constitute quality from the perspective of managers of logistics companies. Or from the perspective of marketers, consider the LSQ framework from the perspective of customers (Mentzer et al., 2001). Both aspects of the scientists' consideration show the role of last-mile delivery staff. However, going deeper and more specifically, no scientist has yet clarified the constitutive factors to improve the rate of successful last-mile delivery. This is the gap that the author wants to delve into and clarify, especially the use of the motivation-opportunity-ability (MOA) theoretical framework by scientists (MacInnis et al., 1991) to explain new findings.

The rest of the paper is structured in the following way. Section 2 overviews the literature related to last-mile delivery performance. Section 3 explains the methodology as well as the research model. Section 4 presents the results of model testing and regression. Section 5 discusses the results and proposes solutions. Section 6 concludes the research.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Hartline and Ferrell's LSQ framework

The authors develop and test a service employee management model that examines constructs simultaneously across three interfaces of the service delivery process: manager-employee, staff roles, and employee-client (Hartline & Ferrell, 1996). The author's perspective on building this LSQ framework is considered from the perspective of logistics companies. The authors examine how the attitudinal and behavioral responses of customer-facing employees can influence customer perceptions of service quality, the relationship between these responses, and three control mechanisms. Formal management control (empowerment, employee evaluation based on behavior, and management commitment to service quality — MCSQ). These findings indicate that managers committed to service quality are more likely to empower their employees and use behavior-based appraisals. However, the use of power has both positive and negative consequences in managing liaison staff. Some negative consequences are mitigated by the positive impact of behavior-based employee appraisals. To enhance customer perception of service quality, managers must increase employee's self-efficacy and job satisfaction, while reducing conflict and ambiguity about employees' roles. Implications for managing customer contact service employees and directions for further research are discussed.

Figure 1. Path diagram of relationships in service employee management

Source: Hartline and Ferrell (1996).

Hartline and Ferrell's (1996) LSQ framework shows that human factors play an important role in the scheme, and to measure the effects, the team performed a series of tasks and focused on collecting data for the following popular scales:

- *Scale to measure employees' own abilities:* "The work is within my capabilities"; "I didn't have any problems adjusting to working at the company"; "I felt unqualified for the job I was doing"; "I have all the knowledge and skills needed to handle my job, all I need now is just practical experience"; "I feel confident that my skills and abilities are equal or superior to those of my colleagues"; "My past experiences and achievements increase my confidence"; "I could have taken on a more difficult job than the one I have now"; "Professionally speaking, my work fully meets my expectations of myself".

- *Measuring employee job satisfaction scale:* "Your general work"; "Your partner"; "Your supervisor"; "Your organization's policies"; "Support provided by your organization, your salary or wages"; "Your opportunities for advancement with this organization and your organization's customers".

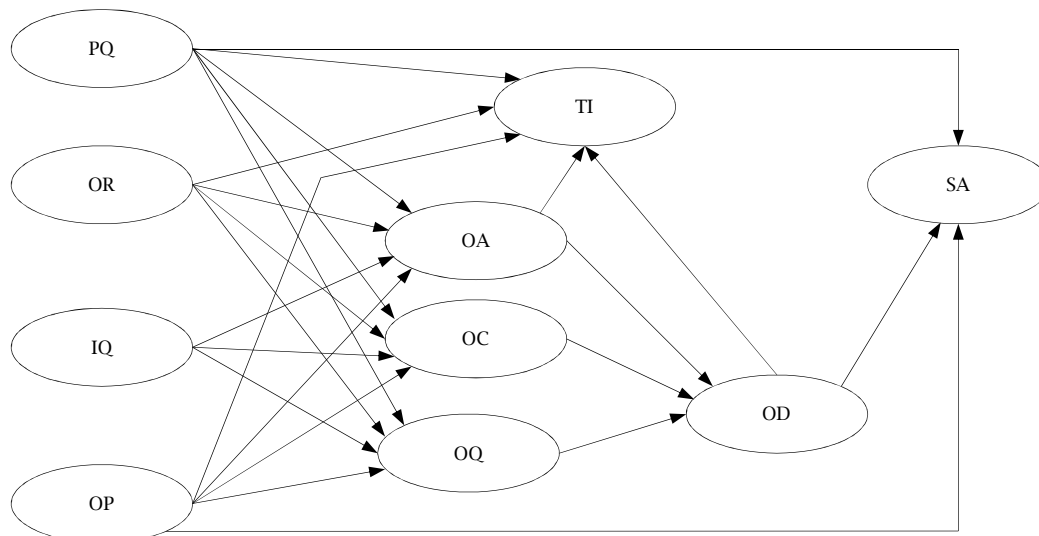
- *Measuring employee adaptability:* "Each customer needs a unique approach"; "When I feel like my approach isn't working, I can easily change to another approach"; "I like to experiment with different approaches"; "I don't change my approach from client to client"; "I am very sensitive to my customers' needs"; "I find it difficult to adapt my style to certain clients"; "I vary my approach depending on the situation"; "I try to understand

how one customer is different from another"; "I feel confident that I can effectively change my approach when necessary"; "I treat all customers pretty much the same".

- *Employee relationship scale:* "The amount of work you plan to do and the amount of work you actually do"; "The number of customers you plan to serve and the number of customers you actually serve"; "The amount of work unrelated to the work you were expected to perform and the amount of work unrelated to the task you actually performed"; "The amount of free time you wish to have and the amount of free time you actually have".

2.2. Service quality framework by Mentzer with colleagues

Based on the customer perspective, the authors present empirical support for nine related logistics service quality constructs; demonstrate their unidirectionality, validity, and reliability across four customer segments of a large logistics company; and provide empirical support for the logistics service quality process. Although structural equation modeling (SEM) provides support for the logistics service quality process across customer segments, the authors find that the relative parameter estimates differ for each segment, which suggests that companies should customize their logistics services according to customer segments.

Figure 2. Logistics service quality process customized by segment

Note: General segment significant paths ($p < 0.01$).
Source: Mentzer et al. (2001).

Elements in the LSQ framework include PQ = personnel contact quality, OR = order release quantities, IQ = information quality, OP = order procedure, OA = order accuracy, OC = order condition, OQ = order quality, OD = order discrepancy handling, TI = timelines, SA = satisfaction. Which PO is a scale consisting of three observations: the delivery staff makes an effort to understand the postal delivery, all problems are resolved by the delivery staff, and the delivery staff's product knowledge/experience is adequate enough (Mentzer et al., 2001).

The scale of perception of order-related constructs positively affects the perception of receiving orders: the quality of personnel contact positively affects OA; the quality of personnel contact positively affects order status; the quality of HR contact positively affects OQ; the quality of personnel contact positively affects TIs; order release quantity positively affects OA; the number of order releases positively affects order status; order release quantity positively affects OQ; the number of order releases positively affects TIs; IQ positively affects OA; IQ positively affects order status; IQ positively affects OQ; IQ positively affects TIs; the ordering process positively affects OA; the ordering process positively affects the order status; the ordering process positively affects OQ; IQ positively affects TIs.

Thus, based on the LSQ quality framework that has been recognized by scientists, both frameworks are considered from two aspects: the logistics manager and the customer aspect, showing the role of the service staff's own factor. Services play the most important core role in improving logistics service efficiency.

2.3. MOA model framework

In this article, the author relies on the MOA model framework of the relationship between "motivation-opportunity-ability", to argue that achieving performance in last-mile delivery depends on the motivation, opportunities, and abilities of the delivery staff, which affects the service quality

and competition of logistics companies. The MOA framework, developed by MacInnis et al. (1991), asserts that the effectiveness of service delivery determines the desire of employees to engage in certain behaviors (MacInnis et al., 1991). In particular, motivation contributes significantly to the performance of behavior in the absence of ability or opportunity and is therefore fundamental to theoretical discussions among behavioral scientists who consider work performance to be the result of direction and evaluation aimed at strengthening the employee's ability to perform the job (Siemsen et al., 2008). Sharing this view (Leung & Bai, 2013) also emphasizes the role of motivation in employee performance/work performance.

In addition, some other authors have used other variations of the MOA model to examine the relationship between high-performance work systems (HPWS) and job performance (Bano et al., 2022; Obaid et al., 2022). MOA plays an active role in shaping behavior, especially motivation that contributes to behavior when there is ability and opportunity. The MOA framework is based on the notion that logistics companies should encourage last-mile delivery staff to acquire the necessary knowledge, abilities, motivation to perform effectively, and the opportunity to complete delivery tasks, increasing your successful delivery rate according to the determined plan. Yildiz et al. (2019) have proven that the MOA model framework is a coherent and consistent theory to explain the differences in behavior, activities, and effectiveness of employees in the company.

2.4. Empirical studies apply the MOA model framework to improve delivery efficiency

The concept of "ability" originated from McClelland's (1973) work to identify intelligence and traditional testing and other tools that predict performance and minimize adverse effects on learners, and should consider ability rather than intelligence (McClelland, 1973). Klemp (1980) defines job ability as the basic characteristic of a person that

brings about superior efficiency and performance on the job (Klemp, 1980). Competencies can be motivations, characteristics, skills, or content expertise. Bemis et al. (1983), abilities are the knowledge, skills, qualities, and other characteristics needed to perform a job (Bemis et al., 1983). The logistics service staff needs to have the knowledge to identify risks (risks related to privacy, technology risks, and natural disaster risks) through delivery staff, taking advantage of them by prioritizing the risks. Possible risks in last-mile delivery to increase competitiveness, increase market share, and minimize delivery costs (Mismar, 2020). Gender demographic factors affect employee capabilities (Edgar et al., 2021). Nguyen and Zelickson (2022) review the ethics and qualities of the delivery staff. Karavaeva (2023) investigates the delivery staff's abilities including knowledge, skills, experience, and health status. Effort expectancy was found to have no effect on behavioral intention; however, favorable conditions have negative effects. Research shows that the reliability factor of the delivery staff itself affects delivery efficiency (Ahmad & Yahya, 2019; Bahrami et al., 2021; Zhong et al., 2022; Miao et al., 2022; Rudawska & Gadomska-Lila, 2023; Yang et al., 2024; Yang & Yang, 2024; Fan et al., 2024). Based on research on workers' abilities, the author proposes the following hypotheses:

H1: Knowledge of employees affects employee ability.

H2: Employee skills impact employee ability.

According to Pinder (2008), a behavioral science researcher, motivation is what motivates and develops employees to achieve goals, behavior is the result of the impact of many factors, many of which have not been mentioned clearly such as frustration at work, and love of work. Motivation is an internal factor of each individual worker. These are activities that encourage and motivate employees to influence the needs of employees to create a change in their behavior toward the goals that the business wants to achieve (Pinder, 2008). Motivation comes from each person themselves. This is an internal state that energizes and directs people into purposeful behavior. In different positions with different psychological characteristics, each person's motivation is also different.

Motivation refers to the process by which individuals focus effort toward a goal and the persistence to sustain this effort over a period of time. Therefore, the motivation of employees in an organization refers to the intensity of their efforts in achieving their work goals and organizational goals. Work motivation is formed from factors within each individual and factors that arise during the work process. When employees work enthusiastically, enthusiastically, and passionately about their work, it will create high labor productivity, contributing to achieving the business goals of the enterprise. To attract and exploit the full potential and creativity of employees, thereby improving business efficiency and performance, motivating employees is extremely necessary and highly meaningful for the business logistics industry.

Basically, the motivation of individual workers is considered to meet different needs (Maslow, 1954). In principle, managers need to know which

level of need their employees are at so that they can know how to influence them to create the highest labor motivation. Motivational factors of employees in the workplace are maintenance factors and motivating factors (Herzberg, 1945). Every fairness creates excitement for employees (Adams, 1963). Good results will encourage employees to work (Vroom, 1964).

Managers of companies are constantly faced with the challenge of managing the motivational factors of employees by satisfying their personal and professional needs, thereby enhancing their performance their job performance (Alonso & Lewis, 2001). The majority of companies in the world focus on employee performance and incentives that can contribute to their performance and productivity (Brewer & Selden, 2000). The variable that has changed the most and has the most positive impact on employee performance is technology, which has motivated postal employees to work more efficiently (Karanja, 2015). Current job characteristics (JOB) of delivery staff who want to increase the successful delivery rate need to improve their knowledge and technological skills (de Stefano, 2015). Working conditions and prices of delivery staff are motivations that also affect the rate of successful last-mile deliveries (Pourrahmani & Jaller, 2021). Delivery companies need to improve the quality of work and life of delivery staff to increase the rate of successful last-mile deliveries (Puram et al., 2021). Applying technology will increase motivation for delivery staff (Garus et al., 2022). Workload reduces delivery staff's motivation (Pourrahmani & Jaller, 2021; Babatunde et al., 2021; Lindqvist et al., 2022; Okafor et al., 2022; Bailey, 2022; Asuzu & EDOM, 2023). Based on research on employee motivation (MOT), the author proposes the following hypotheses:

H3: Employee income affects employee motivation.

H4: Job characteristics affect employee motivation.

H5: Company reputation affects employee motivation.

Opportunity for successful last-mile delivery. Opportunity is a term that describes a condition that is allowed or not allowed to perform a certain action or behavior (Ou-Yang et al., 2014; Iwan et al., 2016; Wang et al., 2016; Rindrasari & Surjandari, 2021; Suguna et al., 2022; Nagpal et al., 2021; Surjandari et al., 2023; Dong et al., 2023; Elsokkary et al., 2023; Moreno-Saavedra et al., 2024). Opportunity is the act of providing service to last-mile customers. The author presents the next hypotheses:

H6: Employee abilities impact last-mile success delivery rate.

H7: Work motivation of last-mile delivery staff affects the success delivery rate.

3. RESEARCH METHODOLOGY

The article uses the partial least squares SEM (PLS-SEM) linear structural model. This is the most suitable method with a theoretical basis because the factors considered have a structural impact. The goal of testing the PLS-SEM linear structural model is to determine the relationship between ABI, work motivation, and success rate in last-mile delivery, implemented on a Statistical Package for the Social Sciences (SPSS) v. 20 and Analysis of Moment Structures (AMOS) v. 20 software (Arbuckle, 2014).

For best results, the author carries out a verification process including: according to (Anderson & Amemiya, 1988; Anderson & Gerbing, 1988), the linear structural model analysis process includes:

1) Checking the quality of the scale (scale test), overall alpha coefficient > 6 and corrected item-total correlation > 0.3.

2) Exploratory factor analysis (EFA): The appropriateness of the measure $0.5 \leq \text{Kaiser-Meyer-Olkin (KMO)} \leq 1$, Bartlett's linear correlation test with a significance level (Sig.) ≤ 0.05 , test the extracted variance > 50% and eigenvalues > 1, factor loadings with sample sizes greater than 255 are required > 0.3 (Hair et al., 2006);

3) Confirmatory factor analysis (CFA): The squared index adjusts the degrees of freedom (Cmin / df.) ≤ 5 (Bentler & Bonett, 1980), Tucker-Lewis index (TLI) > 0.9 (Hu & Bentler, 1998), comparative fit index (CFI) > 0.9

(Hu & Bentler, 1998), normal fit index (NFI) > 0.9 (Hu & Bentler, 1998; Bentler, 1980), root mean square error approximation index (RMSEA) < 0.05 (Browne & Cudeck, 1992);

4) SEM.

The model has the following form:

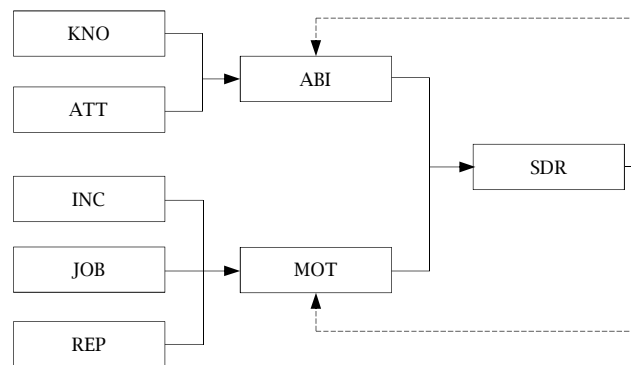
$$ABI = f(KNO, ATT) \quad (1)$$

$$MOT = f(INC, JOB, REP) \quad (2)$$

$$SDR = f(ABI, MOT) \quad (3)$$

where, *ABI* = employee abilities, *KNO* = knowledge of employees, *MOT* = motivation-opportunity-ability, *INC* = employee income, *JOB* = job characteristics, *REP* = company reputation, *SDR* = success delivery rate, *ATT* = attitude.

Figure 3. Research model



Source: Author's elaboration.

All variables in the model are measured using the 5-level Linkert's (1932) scale. This is an expression of a series of answers related to the status of the survey question and the securities staff will select only one of the answers. For each response, a number is selected to reflect the level of mind, and the corresponding numbers can be aggregated to measure the attitude of the employee's responses, number 1 is not at all, number 2 is disagree, number 3 is neutral, number 4 is agree, number 5 is completely agree.

Research data. The research was collected from 375 respondents who are employees of Viettel Post companies, through online sampling on Google Docs in the period from November 2023 to March 2024, the data was cleaned before running the model using SPSS v. 20 and AMOS v. 20 software.

Structure of survey objects:

- **By gender.** Table 1 shows that there were 295 respondents, 266 of whom were male, accounting for 90.17%, and the rest were female, accounting for 9.83%. Statistical data shows that the study sample's characteristic is that the ratio of men is higher than that of women, which is completely consistent with the nature and work characteristics of last-mile delivery staff at Viettel

Post company. This shows that the research sample structure ensures the representativeness of last-mile delivery staff in the logistics industry.

- **According to age.** The sample structure by age shows that delivery staff aged from 20 years old to 30 years old received 133 votes, accounting for 45.08%, and those aged from 31 years old to 40 years old received 139 votes, accounting for 47.12%. From 41 years old to 50 years old, 21 votes were recovered, accounting for 7.12%; for those aged over 50 years old, the author recovered 2 votes, accounting for 0.68%. The survey results show that the age of delivery staff accounting for the majority is from 20 years old to 30 years old, and the age of delivery staff accounting for the least number is over 50 years old.

- **According to educational level.** In the sample structure, 27.80% of respondents only completed high school, 10.8% graduated from intermediate school, 60.34% graduated from college or university, and the remaining 1.02% had good post-university careers. The results show that college and university education level accounts for a high proportion, this is one of the characteristics of Viettel Post's HR structure.

Table 1. Characteristics of survey subjects in the PLS-SEM research model

No.	Respondents	Number (people)	Ratio (%)
Sex			
1	Male	266	90.17
2	Female	29	9.83
Age			
3	From 20 years old to 30 years old	133	45.08
4	From 31 years old to 40 years old	139	47.12
5	From 41 years old to 50 years old	21	7.12
6	Over 50 years old	2	0.68
Academic level			
7	High school graduation	82	27.80
8	Secondary graduation	32	10.85
9	Graduated from college or university	178	60.33
10	After university	3	1.02
Total		295	100

Source: Author's elaboration.

Collected research data is considered to reflect the true situation of the HR structure of Viettel Post company. The research structure focuses on young workers with few years of experience but with a high level of background with university degrees or higher accounting for the majority. Based on theory, the author of the article built a scale as follows.

Table 2. Scale and variables in the PLS-SEM model

No.	Encode	Contents of the survey question list	Citation
I. Knowledge of employees (KNO)			
1	KNO1	Professional knowledge and qualifications compared to colleagues.	Perreault and Russ (1976), McClelland (1973), Blumberg and Pringle (1982), Whetzel et al. (1998), Mismar (2020), Zhong et al. (2022), Karavaeva (2023)
2	KNO2	Knowledge of risk management and safety and security in operations.	
3	KNO3	Knowledge and understanding of customer needs and desires.	
4	KNO4	Knowledge of customer complaint handling procedures.	
II. Employee skills (SKI)			
5	SKI1	Communication and information transfer skills, verbal and written.	McClelland (1973), Whetzel et al. (1998), Karanja (2015), de Stefano (2015), Zhong et al. (2022), Karavaeva (2023)
6	SKI2	Skills in using information technology in last-mile delivery activities.	
7	SKI3	Use foreign language (English).	
8	SKI4	Skills in handling customer complaints.	
III. Employee ability (ABI)			
9	ABI1	My work is within my capabilities.	Hartline and Ferrell (1996), Mentzer et al. (2001), MacInnis et al. (1991), Perreault and Russ (1976), McClelland (1973), Blumberg and Pringle (1982), Whetzel et al. (1998), Mismar (2020), Zhong et al. (2022), Karavaeva (2023)
10	ABI2	I have all the skills needed to handle my job.	
11	ABI3	I could have taken on a more difficult job than the one I have now.	
12	ABI4	My health.	
IV. Employee income (INC)			
13	INC1	Salary and benefits are necessary for the family.	Maslow (1954), Vroom (1964), Perreault and Russ (1977), Mentzer et al. (2001), Blumberg and Pringle (1982), Siemsen et al. (2008), Bano et al. (2022), Obaid et al. (2022)
14	INC2	Salary and benefits are commensurate with work results.	
15	INC3	Salaries and benefits are competitive with the income of other logistics companies.	
V. Job characteristics (JOB)			
16	JOB1	Withstand pressure, mentally and psychologically.	Maslow (1954), Lei et al. (2020), Ballare and Lin (2020), Boysen et al. (2021), Castillo et al. (2022), Younus et al. (2023)
17	JOB2	Always understand the risks that are difficult to avoid at work.	
18	JOB3	Always try your best physically.	
19	JOB4	Amount of work.	
VI. Company reputation (REP)			
20	REP1	Company size.	Maslow (1954)
21	REP2	Financial performance.	
22	REP3	Business philosophy of environmental protection.	
VII. Employee motivation (MOT)			
23	MOT1	My income.	Herzberg (1945), Perreault and Russ (1977), Mentzer et al. (2001), Blumberg and Pringle (1982), Siemsen et al. (2008), Bano et al. (2022), Obaid et al. (2022)
24	MOT2	Job characteristics.	
25	MOT3	Company reputation.	
VIII. Success delivery rate (SDR)			
26	SDR1	Average last-mile delivery rate (below 80%, from 81%-85%, from 86%-90%, from 91%-95%, from 96%-100%).	Interview with experts
27	SDR2	Customer satisfaction rate (under 80%, from 81%-85%, from 86%-90%, from 91%-95%, from 96%-100%).	
28	SDR3	On-time delivery rate (below 80%, from 81%-85%, from 86%-90%, from 91%-95%, from 96%-100%).	

Note: The model has 8 scales and 27 observed variables.

Source: Author's elaboration.

4. RESEARCH RESULTS

4.1. Analyze the reliability of the scale

Perform the Cronbach's alpha test to evaluate the quality of the scale. Results of analyzing the reliability of the scale for the variables that make up the scale with alpha coefficient > 0.6 and corrected item-total correlation > 0.3 are detailed in Table A.1 (see Appendix).

4.2. Exploratory factor analysis

Because the sample size of 295 is in the range of 100 to 350, the absolute value below is chosen to be 0.5. Table 3 shows that the KMO measure has

sampling adequacy = 0.720 within $0.5 < KMO < 1$; Bartlett's test of sphericity is 0.000, and the data used for factor analysis is appropriate.

Table 3. KMO and Bartlett's test

KMO measure of sampling adequacy		0.720
Bartlett's test of sphericity	Approx. Chi-square	3724.257
	Df.	210
	Sig.	0.000

Source: Author's statistics on SPSS 20 software.

According to the results of Table 4 for the variance extraction test, cumulative coefficient (%) = 76.654% > 50%. The eigenvalues coefficient value of the factor group is greater than 1, which is 8 factors.

Table 4. Extracted variance

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings ^a
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total
1	5.279	18.854	18.854	5.279	18.854	18.854	3.861
2	4.501	16.075	34.929	4.501	16.075	34.929	3.643
3	2.999	10.710	45.639	2.999	10.710	45.639	3.841
4	2.233	7.976	53.615	2.233	7.976	53.615	3.660
5	1.923	6.868	60.484	1.923	6.868	60.484	3.471
6	1.637	5.848	66.331	1.637	5.848	66.331	2.600
7	1.283	4.580	70.912	1.283	4.580	70.912	2.480
8	1.048	3.742	74.654	1.048	3.742	74.654	2.457
9	0.794	2.834	77.488				
10	0.766	2.735	80.223				
11	0.636	2.270	82.493				
12	0.567	2.023	84.517				
13	0.511	1.824	86.340				
14	0.477	1.703	88.043				
15	0.392	1.400	89.443				
16	0.357	1.274	90.716				
17	0.335	1.197	91.913				
18	0.320	1.144	93.057				
19	0.281	1.004	94.061				
20	0.261	0.933	94.994				
21	0.256	0.916	95.910				
22	0.225	0.802	96.712				
23	0.211	0.753	97.466				
24	0.183	0.654	98.120				
25	0.169	0.604	98.724				
26	0.152	0.543	99.267				
27	0.125	0.447	99.714				
28	0.080	0.286	100.000				

Note: Extraction method: Principal component analysis. ^a When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Source: Author's statistics on SPSS 20 software.

Appropriate factor loading coefficients of observed variables (factor loading coefficients) > 0.3; after checking the loading factors of the variables,

the variables with loading factors greater than 0.3 are the 28 observed variables. EFA analysis results met the requirements.

Table 5. Component rotation matrix (Part 1)

Variable	Component							
	1	2	3	4	5	6	7	8
KNO1	0.851							
KNO2	0.798							
KNO4	0.733							
KNO3	0.679							
ABI3		0.894						
ABI4		0.890						
ABI2		0.846						
ABI1		0.716						
MOT1			0.985					
MOT2			0.871					
MOT3			0.807					
JOB4				0.850				
JOB3				0.752				
JOB2				0.681				
JOB1				0.627				

Table 5. Component rotation matrix (Part 2)

Variable	Component							
	1	2	3	4	5	6	7	8
SKI2					0.924			
SKI1					0.786			
SKI4					0.784			
SKI3					0.604			
SDR2						0.880		
SDR1						0.854		
SDR3						0.767		
REP1							0.865	
REP2							0.833	
REP3							0.819	
INC3								0.922
INC1								0.830
INC2								0.761

Note: Extraction method: Principal component analysis. Rotation method: Promax with Kaiser normalization. Rotation converged in 7 iterations. Source: Researcher statistics on SPSS 20 software.

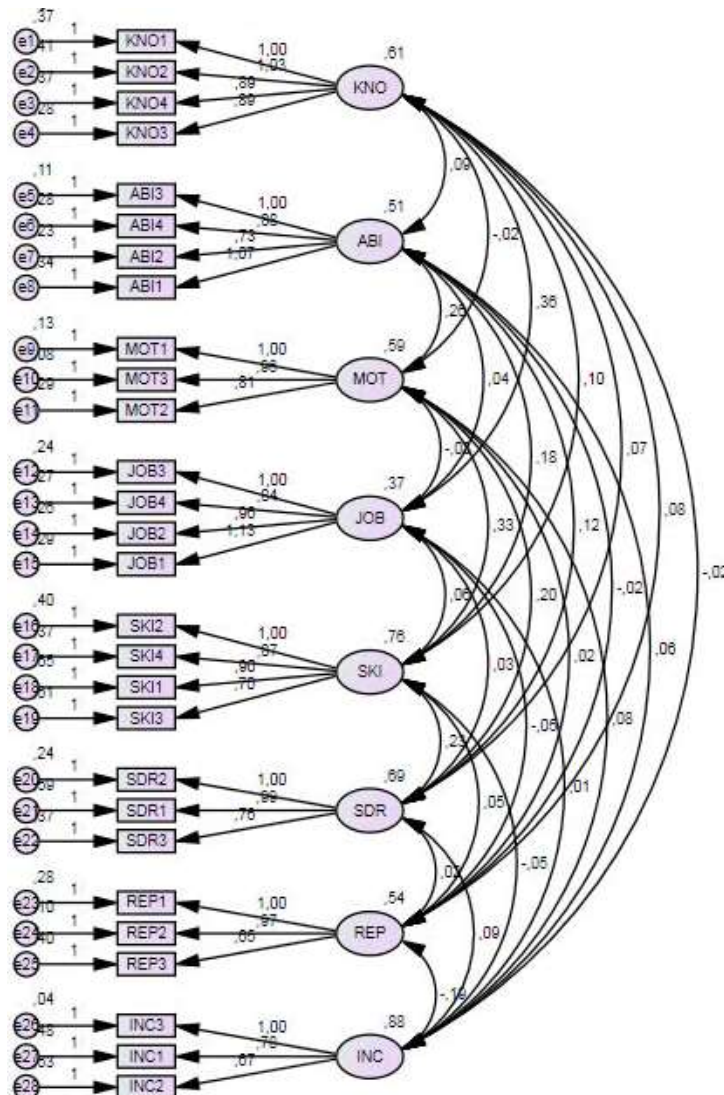
4.3. Confirmatory factor analysis and PLS-SEM linear structure

The results of CFA and linear structural model estimation are shown in the figure below.

The results of CFA show that the Chi-square value adjusted for degrees of freedom (Cmin / df.)

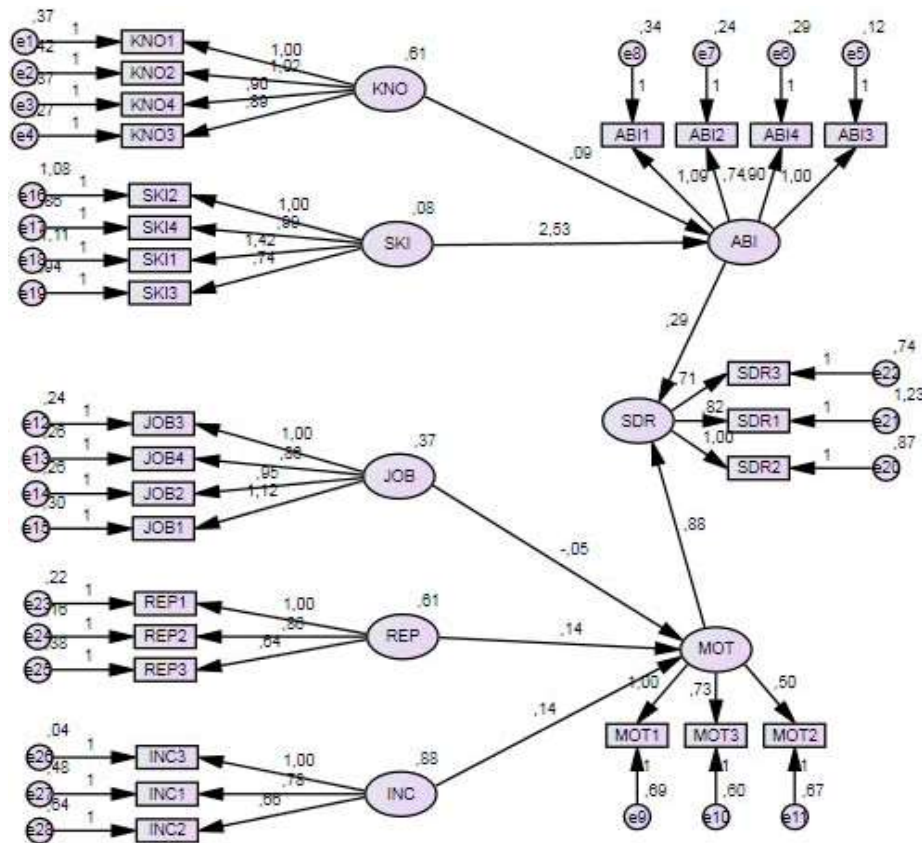
is 4.91, which is in the small value or equal to 5, the TLI value is 0.982, which is larger than 0.9, the CFI value is 0.918 greater than 0.9, NFI is 0.998 and greater than 0.9, RMSEA value is 0.021 less than 0.05. In conclusion, the integrated model is suitable for real data because it meets the testing criteria.

Figure 4. Summary of confirmatory factor analysis



Source: Author's statistics on SPSS 20 software.

Figure 5. Model regression estimation results



Source: Author's statistics on SPSS 20 software

Figure 5 shows that the Chi-square value adjusted for degrees of freedom (Cmin / df.) is 4.93, which is within a value of 5 or less, the TLI value of 0.992 is greater than 0.9, and the CFI value is 0.911 greater than 0.9, NFI 0.988 is greater than 0.9, RMSEA value is 0.041 less than 0.05. In conclusion,

the integrated model is suitable for real data because it meets the testing criteria.

Table 6 with the significance levels of the estimated coefficients: p-value <= 0.05; confidence level >= 95%, factors included in the model are statistically significant and the hypotheses are accepted.

Table 6. Hypothesis testing results

Hypothesis	Impact	Estimate	Std. error	C.R.	p-value	Label
H1	ABI ← KNO	0.182	0.105	1.654	0.028	Accept
H2	ABI ← SKI	2.402	0.516	4.656	***	Accept
H3	MOT ← INC	0.168	0.049	3.434	***	Accept
H4	MOT ← JOB	-0.122	0.065	-0.527	0.127	Reject
H5	MOT ← REP	0.106	0.047	2.238	0.025	Accept
H6	SDR ← ABI	0.323	0.075	4.305	***	Accept
H7	SDR ← MOT	0.625	0.289	2.164	0.03	Accept

Note: *** p-value = 0.000. C.R. — composite reliability.

Source: Author's statistics on AMOS v. 20 software.

Table 6 shows that the variables KNO, and SKI have a positive influence on the variable ABI, with statistical significance p-value <= 0.05. Similar to the variables INC, REP also has the same influence on the variable MOT with statistical significance p-value <= 0.05. Meanwhile, JOB has a negative impact on MOT with a statistical significance p-value > 0.05.

H1, H2, H3, H5, H6, and H7 are all appropriate. Hypothesis H4 rejected.

This test result is appropriate in Vietnam. With the specific nature of Viettel Post's HR in the last-mile delivery industry, the structure accounts for a large proportion of young workers, with a distinct

HR characteristic. Viettel Post's last-mile delivery staff have a successful last-mile delivery rate that depends on their abilities. The staff's qualifications and skills have a significant impact on the successful last-mile delivery rate.

5. DISCUSSION

Based on the results of testing the PLS-SEM regression model, the author of the article proposes solutions to help managers make appropriate policies and decisions in improving the rate of successful last-mile orders work, specifically.

5.1. Solution group through improving the knowledge and qualifications of delivery staff

First, standardize qualifications. It is necessary to develop a roadmap to improve the qualifications of last-mile delivery staff for each commodity segment, ensuring compliance with practice and work conditions. Solutions such as sending employees to study to improve their qualifications or combining workplace training.

Second, improve product knowledge. Delivery staff need to be knowledgeable about the company's products and services, allowing them to answer any questions customers may have and make appropriate recommendations. Companies can deploy product knowledge enhancement for last-mile delivery staff through the following tools:

- *Corporate learning management systems (LMS)*. An online training tool for employees through the creation of custom courses. These systems provide progress tracking, course organization, and training management features to scale company-wide training and development.

- *Training through digital platforms (digital adoption platforms — DAP)*. Provides companies with tools to create application-guided content, such as interactive tutorials and knowledge base onboarding workflows, right in the software. This allows new delivery hires to be trained on all the software tools critical to the delivery job, as well as continuously develop their skills with learning features contextual and timely.

- *Deploy knowledge management system (knowledge management system)*. The system provides an online self-service center for employees to find answers to any questions about company policies, benefits, and processes.

- *Virtual classroom software (virtual classroom software)*. The system allows for distance learning and live, interactive learning experiences.

- *Microlearning platforms (microlearning platforms)*. The platform provides a focused learning experience, typically lasting from a few minutes to about 15 minutes, and is designed for mobile learning.

- *Learning experience platforms (LXP)*. Focus on providing contextual learning experiences and providing end users with self-directed learning paths for employees. These LXP tools manage multiple content from different learning sources, including internal, and external resources to provide learners with diverse materials. LXPs often incorporate social learning, recommendations, and analytics elements to enhance employee engagement and learning outcomes.

Third, train the delivery process regularly. The company needs to implement regular delivery process training for last-mile delivery staff. How to identify and manage delivery metrics tracking (total number of deliveries, on-time deliveries, delivery time per delivery, average time at stop, average cost per delivery), delivery vehicles and equipment, knowledge of queuing, planning delivery routes, coordination and delivery, customer experience.

Fourth, improve knowledge of the law. Delivery workers operate on public roads, making road safety and traffic compliance important. Employees need to understand speed limits, parking regulations, and traffic rules to ensure the safety of themselves and

their goods. The company solution organizes legal sharing sessions, conferences, and short training courses to improve legal knowledge for last-mile delivery staff.

5.2. Solution group through improving the skills of delivery staff

Firstly, improve professionalism. Delivery staff are brand representatives for the company, playing a key role in forming customer awareness of the company. Maintain a professional appearance, adhere to dress codes, and demonstrate manners that contribute to a positive customer image of the company's services. Viettel Post company needs to develop a code of conduct for delivery staff in service provision activities. Code of professional ethics in operational activities. Establishing a system of professional ethics is one of the foundations for building a reputation, establishing relationships between delivery staff, the basis for dealing with customers, protecting the rights of customers, complying with legal regulations, and forming a professional philosophy for each delivery employee.

Second, improve route planning. Strategically devise optimal routes to save time and fuel, while ensuring on-time delivery. Effective route planning is more than just the shortest distance. The solution is that companies need to exploit Global Positioning System (GPS) technology and route optimization software, devising strategies to reduce travel time and fuel use for delivery staff.

5.3. Solution group through employee income

Firstly, the company implements the 3Ps (P1 — pay for position, P2 — pay for a person, P3 — pay for performance) salary policy. If delivery staff is the factor that creates value for Viettel Post company, then the remuneration, salary, bonus, and welfare regime are the decisive factors in attracting, maintaining, and using quality HR. The results of testing the PLS-SEM model show that the income factor has a strong influence on the motivation of delivery staff, and has a positive influence.

The company can apply the 3Ps salary policy: 1) according to job position, 2) according to personal capacity, and 3) according to work results. The 3Ps salary system helps Viettel Post company grasp the value of each job position through the scientific method of analyzing and evaluating job value, helping Viettel Post company proactively pay salaries and understand. The actual capacity of each employee through the capacity framework of each position and capacity profile or assessment results of the actual capacity of employees working by position. Knowing clearly the working efficiency of stock brokerage staff through the method of building key performance indicators helps Viettel Post company pay salaries, increase salaries, reward, use, and promote workers appropriately and fairly.

Second, stock compensation policy. There are two programs that Viettel Post company can apply: a stock bonus program for employees and a stock option program.

Third, a stock bonus program for employees. The nature of the program is that the company does

not reward in cash but in shares to delivery staff who contribute highly to the business process, thereby connecting and motivating workers to be effective and profitable. Attract and retain experienced staff. The form of implementation is that shares are not sold or rewarded directly but are exchanged to employees through the program. The company sets up a trust fund, contributing stocks and cash from the company's after-tax profits to this fund.

5.4. Solution group through job characteristics

The nature of delivery work can sometimes lead to high-pressure situations, such as tight schedules demanding customers or a high volume of orders. Delivery staff need to maintain composure, make good decisions under stress, and ensure work performance. Effective stress management contributes to maintaining a positive attitude and providing customer service during challenging times. The following specific solutions.

First, employee surveys. Regularly deploy survey activities to help delivery staff get feedback on their work, thereby enhancing the value of delivery staff and making them feel respected.

Second, change your micromanagement style. The work of last-mile delivery staff has its own unique characteristics, so they will feel appropriate pressure if they apply a micromanagement approach. Instead, the company focuses on tracking the key metrics that really matter: customer satisfaction ratings or on-time deliveries. Instead of telecommunication, companies can use software solutions that can accurately track the location of delivery staff.

Third, build a system to honor labor achievements. Delivery staff are really satisfied with their achievements such as the number of orders, the number of kilometers exceeded, the number of years of experience, etc.

Fourth, change the form of multitasking work to single-tasking. Typically, delivery staff must perform multiple tasks such as navigation, communication, and documentation. Can switch to single-tasking, divide tasks into smaller tasks, and have clear assignments. And fifth, build reasonable norms for delivery staff.

5.5. Solution group through corporate reputation

Viettel Post needs to develop a code of conduct for delivery staff in service provision activities. Code of professional ethics in operational activities. Establishing a system of professional ethics is one of the foundations for building a reputation, establishing relationships between delivery staff, the basis for dealing with customers, and protecting rights. For customers, comply with legal regulations and form a professional philosophy for each delivery employee.

6. CONCLUSION

In the context of globalization, the process of world economic integration is becoming deeper and deeper, and the role of the logistics industry is increasingly respected. In Vietnam, after the COVID-19 pandemic, HR in the logistics industry has suffered a sharp loss, with a young labor structure and many risks in operational activities, maintaining and improving the quality of HR will be difficult. Creating a premise for the sustainable growth of the logistics industry. Based on a sample of research data collected online by the author of the article from 295 forms of last-mile delivery staff working at Viettel Post company, in the period from November 2023 to March 2024. By using the PLS-SEM linear structural model on SPSS v. 20 and AMOS v. 20 software, the results show that five factors have a strong influence on the successful delivery rate in last block delivery. Based on research, the article provides recommendations for Viettel Post company managers as well as for logistics companies in improving last-mile delivery efficiency, through solution groups such as Group Solution through improving the knowledge and qualifications of delivery staff; solution group through improving the skills of delivery staff; solution group through employee income; solution group through job characteristics; solution group through corporate reputation. However, a limitation of the research is that there is no clear classification of working environments in terms of size and corporate culture, and currently only focuses on employees of one company Viettel Post, the survey object is not really large for many different companies.

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APPENDIX

Table A.1. Scale analysis results for variables in the PLS-SEM model

<i>Variable</i>	<i>Scale means if the item deleted</i>	<i>Scale variance if item deleted</i>	<i>Corrected item-total correlation</i>	<i>Squared multiple correlation</i>	<i>Cronbach's alpha if the item deleted</i>
Factor 1, Cronbach's alpha = 0.860					
<i>KNO1</i>	11.61	5.913	0.720	0.547	0.817
<i>KNO2</i>	11.55	5.792	0.709	0.539	0.823
<i>KNO3</i>	11.35	6.404	0.727	0.562	0.816
<i>KNO4</i>	11.40	6.336	0.680	0.519	0.833
Factor 2, Cronbach's alpha = 0.814					
<i>SKI1</i>	8.32	6.299	0.639	0.412	0.766
<i>SKI2</i>	8.44	6.241	0.704	0.536	0.732
<i>SKI3</i>	8.55	7.228	0.557	0.340	0.801
<i>SKI4</i>	8.28	6.956	0.644	0.488	0.764
Factor 3, Cronbach's alpha = 0.839					
<i>JOB1</i>	12.12	3.694	0.687	0.511	0.792
<i>JOB2</i>	12.00	4.071	0.675	0.480	0.795
<i>JOB3</i>	11.98	4.006	0.694	0.509	0.787
<i>JOB4</i>	11.95	4.297	0.640	0.450	0.811
Factor 4, Cronbach's alpha = 0.821					
<i>REP1</i>	4.99	1.898	0.730	0.576	0.700
<i>REP2</i>	4.68	2.231	0.735	0.574	0.698
<i>REP3</i>	4.89	2.482	0.579	0.335	0.845
Factor 5, Cronbach's alpha = 0.801					
<i>INC1</i>	7.66	3.117	0.623	0.502	0.752
<i>INC2</i>	7.47	3.311	0.549	0.365	0.829
<i>INC3</i>	7.47	2.896	0.780	0.618	0.587
Factor 6, Cronbach's alpha = 0.872					
<i>ABI1</i>	10.58	4.191	0.708	0.551	0.852
<i>ABI2</i>	10.18	5.170	0.688	0.490	0.853
<i>ABI3</i>	10.35	4.527	0.826	0.684	0.797
<i>ABI4</i>	10.44	4.669	0.715	0.536	0.840
Factor 7, Cronbach's alpha = 0.815					
<i>MOT1</i>	6.81	2.166	0.861	0.767	0.804
<i>MOT2</i>	6.82	2.461	0.729	0.539	0.918
<i>MOT3</i>	6.72	2.407	0.821	0.730	0.842
Factor 8, Cronbach's alpha = 0.822					
<i>SDR1</i>	7.13	2.763	0.651	0.435	0.762
<i>SDR2</i>	7.26	3.092	0.717	0.515	0.679
<i>SDR3</i>	6.91	3.600	0.630	0.413	0.773

Source: Author's statistics on SPSS v. 20 software.