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Continuous Improvement: An Empirical Review in Vietnam

Hoa Trong Hoang
Vietnam National University, Hanoi 144 Xuan Thuy, Cau Giay, Hanoi, Vietnam

Ha Thu Nguyen
Center for Business Administration Studies, VNU University of Economics and Business, Hanoi, Vietnam

Anh Chi Phan
Center for Business Administration Studies, VNU University of Economics and Business, Hanoi, Vietnam

Duong Huy Phan
Faculty of Political Economics, VNU University of Economics and Business, Hanoi, Vietnam

Phong Thai Le
Faculty of Business Administration, Foreign Trade University, Hanoi, Vietnam

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Contact: Hoa Trong Hoang - hoangtronghoa1988@gmail.com, Ha Thu Nguyen - thuhanguyen179@gmail.com, Anh Chi Phan - anhpc@vnu.edu.vn, Duong Huy Phan - duongph@vnu.edu.vn, Phong Thai Le - lethaiphong@ftu.edu.vn.
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Hoa Trong Hoang
Vietnam National University, Hanoi 144 Xuan Thuy, Cau Giay, Hanoi, Vietnam

Phong Thai Le
Faculty of Business Administration, Foreign Trade University, Hanoi, Vietnam

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1. INTRODUCTION

Since its birth, Continuous improvement (CI) has added remarkable values to the competitiveness of numerous companies globally (Bessant and Caffyn, 1997). Through years of evolution, this concept has been proven useful to an extensive amount of companies across fields, sizes, types and geographical areas (Bessant et al., 2001). CI practices were especially popular among high-performing companies in Japan, the United States and Europe, before the concept was later introduced to firms in developing Asian countries (Giroud, 2007). Experience with CI in other economies has been positive, and Vietnamese companies are expected to also benefit tremendously from this trend (Nguyen, 2015a).

During the 1980s, the defective economic system of Vietnam yielded undeniably worrying outcomes. The country's deteriorating living conditions forced its ruling party to issue an economic reform, though without changing the political system (Diez, 2016). Moving from the centrally planned economy since "Doi Moi" (Renovation) in 1986, Vietnam has seen a good number of considerable economic achievements. Consistent GDP growth, sharp fall in poverty rates, added by increasingly larger shares of manufacturing and services are examples of how the economy has succeeded with its structural change (McCaig & Pavcnik, 2013).

Yet, despite the fact that Vietnamese economy has embraced a flourishing private sector, 30 years after the unprecedented economic reforms, Vietnamese companies are still ranked low in terms of global competitiveness (Ozgen & Minsky, 2016). In an extensive report by Ketels et al. (2010), despite impressive growth in quantity, Vietnamese companies' quality remained poor, due to uneasy challenges such as low level of education and staff training, weak corporate governance and transparency, and limited role in policy dialogue and advocacy. Efforts have been made to upgrade the situations. Suggested by a number of authors (Nguyen and Robinson, 2010; Sonobe et al., 2011; Minh, 2015; Nguyen 2015), Continuous improvement is among the viable answers to Vietnamese companies' current level of sophistication.

Though recently, scholar attention paid to CI in Vietnam has been growing, not much has been done in describing the detailed current situation of CI in Vietnam and the linkage of CI practices to firm performance. This study aims to fill that gap. Following there will be further review of Continuous improvement as a concept, its history and recent studies in the context of Vietnam; then the design of this research is discussed with findings followed.

2. LITERATURE REVIEW

2.1 Continuous improvement

The term Continuous improvement is widely agreed to originate from the Japanese word "Kaizen" (Imai, 1986) yet, Schroeder and Robinson (1991) labeled it "America's most successful export to Japan". The two authors believed that the story of CI started before Kaizen was popular in Japan, and well before the concept was reversely adopted back to Western corporations. According to them, the first quality improvement initiatives date back to late 1800s, when a number of Western firms started encouraging employees to contribute ideas which helped improve their organizations on various aspects. Reportedly, a Scottish shipbuilder named Denny of Dumbarton created the first suggestion system – a common practice of today's Kaizen – in the United Kingdom. Another example of early CI practices occurred in the United States, at a firm called National Cash Register Company, where CI activities did not stop at suggestion system. The company went further to create a good work environment, train and develop its employees extensively, for them being an essential part of all the company's improvements. Examples of CI practices from the West prior to Kaizen went on. Nonetheless, the concept remained unsystematically scattered. Only until the end of World

War II, it was introduced in Japan (Robinson 1990), and Kaizen became one of Japanese companies' greatest competitive edges thereafter (Imai, 1986).

Continuous improvement, according to Bessant and Caffyn (1997), has a number of rather open definitions. Some view it as a philosophy of incremental improvements (Juergensen, 2000); some think it equals to "innovation" applied in various aspects of a firm (Bessant et al., 1994); some summarize the term into specific quality management programs and initiatives (Gallagher et al., 1997). In an overview of scientific work on CI, Nadia and Amit (2005) defined it as "a culture of sustained improvement targeting the elimination of waste in all systems and processes of an organization. It involves everyone working together to make improvements without necessarily making huge capital investments." However, adding to this definition, Bhuiyan and Baghel believed that forms of CI could be both incremental – via the firm's evolution – and radical – as a result of new technology. This definition encompasses also breakthrough innovations which, from Ashkenas's (2012) point of view, may fundamentally contradict the idea of CI. In a work by Brunet and New (2003), CI is concluded to be characterized by three important pillars:

1) It is continuous like a never-ending journey towards quality and efficiency;
2) It is often incremental – as Ashkenas asserted;
3) It is participative in nature, meaning that all members of the organization are a part of the grander improvement theme.

To summarize the review of CI definitions, it is clear that CI or Kaizen could be a philosophy or specific programs and initiatives; it could also be both. In order to make use of this concept, it is vital for companies to understand which concrete practices and activities are needed to be in place. Therefore, it is necessary for this study to find out the current situation of CI practices in the context of Vietnamese companies, an emerging market that has caught increasing attention from scholars.

2.2 Continuous improvement in Vietnam

In Vietnam, quality management is right now among the key issues, and Continuous improvement is gradually taking an important role in Vietnamese firms' management system (Anh et al., 2015). Thanks to the similarities in terms of culture and management styles, Vietnamese companies naturally embrace the Japanese Kaizen concept (Minh, 2015). Nonetheless, the implementation phase certainly does not come without challenges. In a long-term observation, Nguyen and Robinson (2010) found a number of uneasy obstacles for Vietnamese companies to succeed with Kaize. First, betting on cheap labor distracts managers of Vietnamese firms from focusing on improving operations and quality. To them, quality certifications tend to serve as cosmetic trophies rather than any practical steps forward, since low cost continues to be their primary competitive edge. Second, Vietnamese companies are generally faced with serious shortage of skilled-labor. While cheap labors are plentiful, those with necessary skills and qualifications are said to be extremely rare. The issue is worsened as employees tend to switch jobs for slight income increase, due to low average wages. Third, Vietnamese firm's management mindsets are rather short-term. Immediate gaining is most of the time prioritized. This leads management to ignore sustainable and long-term measures such as CI. And last but not least, the lack of knowledge transfer yet, coupled with fierce competition from FDI enterprises, virtually bar Vietnamese firms from advancing their know-how, and consequently stuck at low-cost and low-value segment.

Despite the challenges, a proportion of Vietnamese firms are successfully implementing CI practices as a result of some key enablers (Nguyen, 2015a; Nguyen & Robinson, 2015). First, strong commitment from top management is well critical for companies to jump start

their CI efforts. Without such commitment, the current way of operating that Vietnamese managers have been used to for years would hold them back from making any significant changes. Second, the hierarchical culture make steering committees of authority change agents indispensable to facilitate the implementation of CI. And finally, since the CI concept is still new in Vietnam and Vietnamese personnel are not necessarily fluent with new quality expertise, heavy investments in education and training are unquestionably expected. One interesting note from the authors is that, though reward systems are widely believed to be an useful means for employees' involvement in incremental innovations, reality proves that they have been poorly executed and unfortunately hindering CI implementation efforts.

CI practices in Vietnamese companies have not been studied extensively. Nevertheless, following their exposure to this field with local firms, Anh et al. (2015) and Nguyen (2015b) documented a number of common CI practices in Vietnam, namely:

1) **Suggestion system**: the theme where employees contribute innovative ideas on various aspects of the firm for better improvement;
2) **Quality Control Circle**: organization of small groups to identify, discuss and offer viable solution to ongoing issues;
3) **PDCA**: the Plan-Do-Check-Act cycle of quality management, comparing actual results to target outcomes and take necessary corrective measures.
4) **5S**: a system of 5 keys – Sort (Seiri), Set in Order (Seiton), Shine (Seiso), Standardize (Seiketsu), and Sustain (Shitsuke) – to reduce waste and optimize productivity;
5) **7 Quality control (QC) Tools**: the basic quality tools designed to troubleshoot quality issues;
6) **Process Control**: the act of evaluating, documenting and maintaining existing processes in companies.
7) **Quality improvement activities**: other activities covering the control and refinement of different aspects of firm's operations.

Based on the above synthesis, this study identifies the current situation of the common CI practices in Vietnam scoped down to the concrete CI tools i.e. PDCA, 5S and 7 QC Tools, for they are considered the most basic and foundational CI tools that local firms have been relatively familiar with and tend to turn to when thinking of applying CI practices to their organizations (Nguyen 2013). While the application of 5S in local firms is usually aimed at giving order and discipline for efficiency improvement, PDCA and 7 QC Tools are for troubleshooting of quality issues on strategy and implementation levels. On the other hand, local management is still widely skeptical about the impacts of CI implementation, the study will also examine these CI tools' possible linkages to firm performance with emphasis on product and service quality. The linkages examined are not necessarily cause-and-effect relationships but rather, the possible correlations between the factors. For that, the study's analytical framework was established and presented in Figure 1.

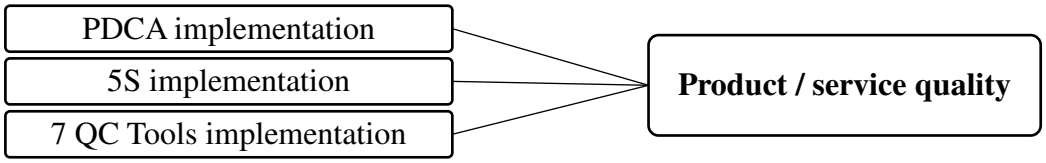

FIGURE 1. Analytical framework

(*Source: Authors propose*)

Our study thus, aims to answer two main questions:

1) What are the current situation of CI practices in Vietnamese companies?
2) Are there potential linkages between the CI practices and firm performance in these companies?

Accomplishing these objectives will fill the current gap of understanding about CI practices in Vietnam as an emerging economy. Besides, the outcomes will help management in Vietnam benchmark their implementation of CI practices with their peers, and grasp more comprehensive insights of CI and its value to their companies. The sole hypothesis of this study is accordingly: There are positive correlations between CI practices and firm's performance in Vietnam.

3. DATA COLLECTION AND ANALYSIS

The first part of our survey is to investigate the current situation of CI practices in Vietnamese companies by examining the state of implementation of PDCA approach, 5S and 7 QC Tools as follows:

a) Current situation of Continuous Improvement Tools practices

PDCA approach implementation: The Quality Manager was asked to indicate the state of Deming's approach "Plan – Do – Check - Action" implementation in the company:

1- Not trained and implemented at all
2- Trained but not yet implemented
3- Trained and implemented

5S Implementation: The Quality Manager was asked to indicate the state of Japanese tool 5S (Seiri, Seiton, Seiso, Seiketsu, and Shitsuke) implementation in the company

1- Not trained and implemented at all
2- Trained but not yet implemented
3- Trained and implemented

7 QC Tools implementation: The Quality Manager was asked to indicate the state of implementing 7 QC Tools (Stratification, Histogram, Check Sheet, Cause-and-effect diagram, Pareto chart, Scatter diagram, Control chart)

1- Not trained and implemented at all
2- Trained but not yet implemented
3- Trained and implemented

b) Selected performance on product and service quality:

The measurements of product quality were based on Garvin's (1988) approach on the eight dimensions of product quality which are:

- *Performance*: the must-have primary characteristics of the product which Customers base mostly on to make functional preferences;
- *Features*: the secondary aspects of performance, making the product more appealing to customers;
- *Reliability*: the chances that the product may fail or malfunction within a time period. The lower the rate, the more reliable the product is;

- *Conformance*: how precisely the product meets its specifications and standards;
- *Durability*: the life time of the product. When the products can be repaired, it is measured up to the point when replacement is more economical;
- *Serviceability*: how conveniently the product in need for repairing can receive appropriate treatment;
- *Aesthetics*: the personal preferences over the product i.e. the look and feel, etc. which make up the identity of its brand;
- *Perceived quality*: the indirect quality measures that customers have on the product as a result of the lack of information and hands-on experience.

The measurements of service quality were based on Parasuraman's (1988) framework SERVQUAL, outlining the five dimensions of service quality:

- *Reliability*: how closely service is performed as promised;
- *Assurance*: how staff are able to build a trusted relationship with customers;
- *Tangibles*: the looks of all the facilities, equipment, etc. what customers can see;
- *Empathy*: how customers are treated with care;
- *Responsiveness*: how staff are prompt to service customers.

The QM was asked to assess the level of product quality and service quality in comparison with the main competitors of the company in the market in 5-point Likert scale (*1-Significant lower; 2-Lower; 3-About the same; 4-Higher; 5-Significant higher*). Data of this study was collected during 2014 - 2015 by focusing on Vietnamese companies certified by ISO 9001 after 2010. The list of 200 certified companies was provided by Vietnam Directorate of Standards and Quality (Stameq). The authors contacted and sent the questionnaire to these 200 firms and received feedbacks from 104 of those – the response rate of 52%, which is generally the average level of response rate when it comes to research work in Vietnam. Among them, 24 incomplete feedbacks were excluded because the missing values will impact the reliability of the analysis. The remaining 80 fully-filled feedbacks were then used for further analysis. Characteristics of the final sample are summarized as follow:

- 60 companies are in manufacturing business (electric/ electronic: 20, textile: 16, mechanical: 10, automobile/ transportation: 8, and chemistry/ plastic products: 6)
- 20 companies are in service business (IT service: 8, retailer: 4, consulting: 3, and trading: 5)
- Average business experience: 12 years
- Average employee number: 355
- Average turnover: 13.5 US$ millions

4. DATA ANALYSIS

Data was tested for reliability and validity. In this case, Cronbach's alpha coefficient is calculated to evaluate the reliability of each measurement scale. Table I shows that the alpha values for product quality (.716) and service scales (.764) exceeded the minimum acceptable level of 0.60. The construct validity is also tested to ensure that all question items in a scale all measure the same thing. Within-scale factor analysis is conducted with the three criteria: (1) uni-dimensionality, (2) a minimum eigenvalue of 1, and (3) item factor loadings in excess of 0.40. The results of the measurement test indicate that two scales are satisfactory in terms of the construct validity.

TABLE I. Descriptive analysis

Scale and items	Cronbach's Alpha values	Minimum	Maximum	Mean	Std. Deviation
Performance					
Product quality	***.716***	***2.88***	***5.00***	***4.05***	***0.40***
Performance		3.00	5.00	4.00	0.49
Features		2.00	5.00	3.88	0.70
Reliability		2.00	5.00	4.27	0.74
Conformance		1.00	5.00	4.33	0.73
Durability		3.00	5.00	4.15	0.74
Serviceability		2.00	5.00	3.57	0.73
Aesthetics		2.00	5.00	3.95	0.83
Perceived quality		3.00	5.00	4.35	0.61
Service quality	***.764***	***2.80***	***5.00***	***4.53***	***0.42***
Reliability		3.00	5.00	4.74	0.52
Assurance		3.00	5.00	4.50	0.64
Tangibles		2.00	5.00	4.33	0.80
Empathy		3.00	5.00	4.63	0.52
Responsiveness		3.00	5.00	4.43	0.66

(*Source: Authors' calculation*)

Both quality performance scales have rather high average (above 4.00 out of the maximum 5.00 scale), with Service quality appear higher mean than Product quality. Concerning the Product quality's eight dimensions, companies seem most and consistently confident with their products' Perceived quality (high Mean at 4.35 and low Standard deviation at .61). Meanwhile Serviceability is rated at the lowest Mean, indicating the currently poor level of post-sale service among the surveyed companies. Opinions on Aesthetics, though at relatively high Mean, are highly spread at highest Standard Deviation, which shows the "personal preference" nature of this dimension. When it comes to Service quality's dimensions, all the five have high Mean at approximately 4.50.

The next step is to compare the quality performance of the companies by the level of CI practices implementation. First, we examine the quality performance of the companies by the level of PDCA implementation. We divide the companies into 3 groups depending on their state of PDCA implementation. Number of companies belonging to Group 1, 2 and 3 are respectively 2, 4 and 74.

TABLE II. Quality Performance classified by the state of PDCA Implementation

	G1		***G2***		***G3***		***ANOVA TEST***
	Mean	***STD***	***Mean***	***STD***	***Mean***	***STD***	***Sig.***
Product quality	2.88		4.22	0.12	4.06	0.05	**.008**
Performance	4.00	1.41	3.75	0.50	4.02	0.06	.581
Features	3.50	2.12	4.00		3.89	0.09	.706
Reliability	4.00	1.41	4.75	0.50	4.25	0.10	.372
Conformance	4.00	1.41	4.25	0.50	4.35	0.10	.782
Durability	4.00	1.41	4.00	1.15	4.17	0.10	.871
Serviceability	3.00		3.75	0.50	3.57	0.10	.659
Aesthetics	3.50	0.71	4.75	0.50	3.91	0.11	.108
Perceived quality	4.00	1.41	4.50	0.58	4.35	0.08	.641

Service quality	3.90	1.56	4.40		4.55	0.05	.090
Reliability	4.00	1.41	4.00		4.78	0.06	**.037**
Assurance	4.00	1.41	5.00		4.51	0.09	.402
Tangibles	3.50	2.12	5.00		4.35	0.10	.240
Empathy	4.00	1.41	4.00		4.67	0.07	.100
Responsiveness	4.00	1.41	4.00	0.12	4.45	0.09	.527

(*Source: Authors' calculation*)

From Table II, it can be seen that the level of PDCA implementation have significant linkage to companies' performance in terms of Product quality overall (p = .01) and the Reliability aspect within Service quality (p = .03). Those companies that have trained their staff with PDCA have these two variables' Mean higher than those that have not.

Next, we examine the quality performance of the companies by the level of 5S implementation. We divide companies into 5 groups depending on their state of 5S implementation. Number of companies belong to Group 1, 2 and 3 are 2, 20, 58 respectively. Table III shows a summary.

TABLE III. Quality Performance classified by the state of 5S Implementation

	G1		***G2***		***G3***		***ANOVA TEST***
	Mean	***STD***	***Mean***	***STD***	***Mean***	***STD***	***Sig.***
Product quality	2,88		3,98	0,26	4,10	0,40	**0,007**
Performance	4,00	1,41	4,00	0,41	4,00	0,48	1,000
Features	3,50	2,12	4,08	0,49	3,84	0,68	0,420
Reliability	4,00	1,41	4,38	0,51	4,25	0,78	0,743
Conformance	4,00	1,41	4,15	0,38	4,40	0,78	0,461
Durability	4,00	1,41	4,00	0,82	4,20	0,70	0,659
Serviceability	3,00		3,31	0,85	3,66	0,68	0,231
Aesthetics	3,50	0,71	3,77	1,09	4,02	0,75	0,471
Perceived quality	4,00	1,41	4,15	0,69	4,42	0,54	0,267
Service quality	3,90	1,56	4,52	0,38	4,56	0,34	0,093
Reliability	4,00	1,41	4,77	0,44	4,77	0,48	0,122
Assurance	4,00	1,41	4,23	0,83	4,62	0,49	0,087
Tangibles	3,50	2,12	4,31	0,85	4,38	0,71	0,316
Empathy	4,00	1,41	4,85	0,38	4,59	0,50	**0,047**
Responsiveness	4,00	1,41	4,46	0,78	4,44	0,60	0,654

(*Source: Authors' calculation*)

5S Implementation also holds significant links to overall Product quality, besides Empathy and Responsiveness within Service quality. Furthermore, Means of these dimensions across groups also indicate that companies that have trained and implemented 5S have higher performance results.

Third, the companies' quality performance by the level of 7 QC Tools implementation was investigated. Groups are formed according to their state of 7 QC Tools implementation. Interestingly, the sample's answers fall into only two categories: Group 2 – trained but not yet implemented and Group 3 – trained and implemented. Their counts are 3 and 77 respectively. Table IV gives a summary.

TABLE IV. Quality Performance classified by the state of 7 Tools Implementation

	G2		***G3***		***ANOVA TEST***

	Mean	*STD*	*Mean*	*STD*	*Sig.*
Product quality	4.25	0.13	4.04	0.41	0.383
Performance	4.00	1.00	4.00	0.47	1.000
Features	4.00	-	3.88	0.72	0.765
Reliability	4.33	0.58	4.27	0.75	0.883
Conformance	4.33	0.58	4.33	0.74	1.000
Durability	5.00	-	4.11	0.73	**0.040**
Serviceability	3.33	0.58	3.58	0.74	0.570
Aesthetics	4.00	1.00	3.95	0.83	0.916
Perceived quality	5.00	-	4.32	0.60	0.056
Service quality	4.10	0.42	4.54	0.41	0.145
Reliability	4.50	0.71	4.75	0.52	0.510
Assurance	4.50	0.71	4.50	0.64	1.000
Tangibles	4.00	1.41	4.35	0.79	0.554
Empathy	4.00	-	4.65	0.52	0.084
Responsiveness	3.50	0.71	4.46	0.64	**0.043**

(*Source: Authors' calculation*)

When it comes to 7 QC Tools implementation, Durability within Product quality and Responsiveness within Service quality are significantly impacted in statistical terms. Figure 2 summaries all the links that have been found between the CI practices and performance dimensions.

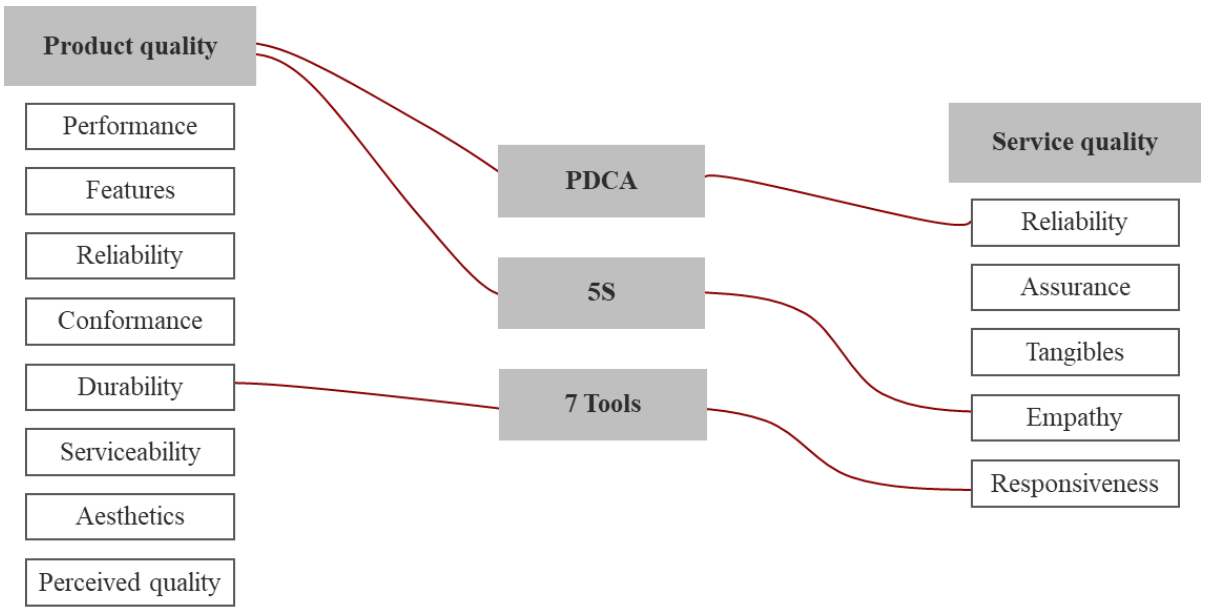

FIGURE 2. Correlation values between CI practices and performance variables

(*Source: Authors' summary*)

As can be seen, all the CI tools have links to both Product quality and Service quality on different levels. In other words, companies have sinificantly distinct performances on their product and service dimensions based on the level of implementation of each CI tool at their firms.

5. DISCUSSIONS AND CONCLUSION

Results have shown that the CI tools implemented at the Vietnamese companies under investigation are at good level, though without being perfect. This finding, to some extent, is in line with previous conclusions regarding the spreading CI practices implementation in Vietnam (Nguyen, 2015a). Nonetheless, Vietnam is still lagging behind other countries; for example, companies in Hong Kong and Japan has successfully improved quality of product with 5S deployment since long ago (Ho, 1999; Ho and Cicmil 1996).

An interesting finding is that all the CI tools have indicated significant correlations to aspects within both Product and Service quality. PDCA and 5S seem correlated to Product quality on general level, while 7 QC Tools implementation has link to one single Product quality aspect (Reliability). When it comes to Service quality, the dimensions namely Reliability, Empathy and Responsiveness are individually correlated to each of the tools. This poses an implications for management in Vietnam or any other developing countries who are still betting on cheap labor and think that quality improvement initiatives such as the CI tools are of not much value to their enterprises. It is not necessary that implementing a particular tool would affect one particular aspects of product and service quality, but it is very likely that the better performance in product and service quality is contributed by comprehensive implementation of CI tools and practices.

This study also has limitations. In terms of methodology, this study utilizes survey data gathered via self-reported questionnaires and individual bias in reporting may exist. Because of the time and resource limitation, the sample size is relative small. These limitations restricted the scope of the studies and the conclusion of the study. To overcome these limitations, the authors did arrange more indepth discussions with a number of randomly selected respondents to understand their own perceptions of the ratings they have for themselves. The results showed that many respondents tend to belive they are performing at least equal to industry average. However, they seemed extra cautious when rating one category with 5 points. Future research should be conducted with an expanded sample which allows the researchers to use more comprehensive techniques to investigate the effectiveness of specific continuous improvement tools & techniques and impact of continuous improvement on business performance.

In summary, the study aimed at filling the gap within CI practices theory in the context of Vietnam. Initial results regarding the reality of CI practices implementation have been exhibited, though a number of question marks did follow. These are rather preliminary results for this field of study in Vietnam, because the research scope could have been broader – covering many other aspects of CI practices rather than the CI tools, and meaningful findings are mainly based on simple analysis. This puts forth the need for further examination of these findings to articulate more in depth insights, on a wider scale in terms of both sample and concepts. In addition, though the correlation analysis indicates links between the CI practices and performance, further studies should continue to investigate the possible cause-and-effect relationship between them.

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APPENDIX

SURVEY QUESTIONNAIRS

Respondent: Quality Managers

1) Continuous Improvements Tools:

PDCA approach implementation:

Indicate the state of Deming's approach "Plan – Do – Check - Action" implementation at your company:

1- Not trained and implemented at all

2- Trained but not yet implemented

3- Trained and implemented

5S Implementation:

Indicate the state of Japanese tool 5S (Seiri, Seiton, Seiso, Seiketsu, and Shitsuke) implementation at your company

1- Not trained and implemented at all

2- Trained but not yet implemented

3- Trained and implemented

7 QC Tools implementation:

Indicate the state of implementing 7 QC Tools (Stratification, Histogram, Check Sheet, Cause-and-effect diagram, Pareto chart, Scatter diagram, Control chart) at your company:

1- Not trained and implemented at all

2- Trained but not yet implemented

3- Trained and implemented

2) Performance on product and service quality

Product Quality

Evaluate your Product Quality compared to competitors on the following dimensions (scale from 1 to 5: 1 = significantly worse than competitors; 2 = relatively worse than competitors; 3 = equivalent to competitors; 4 = relatively better than competitors; 5 = significantly better than competitors)

1. Basic functions of the product
2. Additional features of the product
3. Rate of product failure or malfunction during warranty period
4. Rate of product errors during production
5. The durability of the product
6. The ease of maintenance and repair when customers are in need
7. The look and feel of the product
8. Customers' perception and attitude toward the product

Service Quality

Evaluate your Product Quality compared to competitors on the following dimensions (scale from 1 to 5: 1 = significantly worse than competitors; 2 = relatively worse than competitors; 3 = equivalent to competitors; 4 = relatively better than competitors; 5 = significantly better than competitors)

1. Services are implemented on time and as requested
2. Staff are well hospitable and willing to serve customers
3. Facilities and equipments offer professional touch
4. Customers are served professionally
5. Staff pay immediate attention to customers