



**The impact of Soft Lean Practices on business performance:
mediating role of customer satisfaction**

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Abstract

Purpose – Many firms have adopted different methodologies such as Lean Management (LM) to increase customer satisfaction. This is because they need to respond to customer demands for improved products and responsive service. This research aims to evaluate the influence of Soft Lean Practices (SLP) on business performance in the service sector.

Design/methodology/approach – Out of 702 questionnaires distributed to various service companies in Zimbabwe, 260 valid responses were received. Structural Equation Modelling was used to assess the relationship among the factors of the proposed model.

Findings –The implementation of SLP leads to improvement in the business performance of the service companies. However, the impact of SLP on business performance is mainly indirect, mediated by customer satisfaction.

Research limitations/implications – The research focused on the implementation of SLP in the service industry of a developing country, hence, the results obtained may require further investigations before generalization to other countries with different socio-cultural contexts is made.

Originality/value – Most previous studies focused mainly on the implementation of the Technical Lean Practices (TLP) in the manufacturing industry without properly acknowledging the importance of SLP. This research investigates the importance of SLP in the service sector and further explores the mediatory role of customer satisfaction on business performance. The findings also validate the service-profit-chain theory.

Keywords Lean management, Business performance, Soft Lean Practices, Service industry, Customer satisfaction, Service-profit-chain

Type of Paper Research paper

1. Introduction

Many companies today offer similar services, hence, higher quality and increased customer satisfaction have become the distinguishing factors for competitiveness (Vaishnavi and Suresh, 2020). Thus, service companies have to compete efficiently and effectively by responding quickly to demand from the market to avoid competitive disadvantages that can force them out of business (Vashishth *et al.*, 2019). A decline in service quality might induce increased customer complaints, hence, the need to intensify their business process improvement efforts, and cope better with the demand pressures from customers and market turbulence (Alsmadi *et al.*, 2012). Consequently, to increase customer satisfaction, businesses now adopt diverse improvement approaches, one of which is Lean Management (LM).

LM practices consist of Technical Lean Practices (TLP) and Soft Lean Practices (SLP) (Bortolotti *et al.*, 2015). TLP, also called hard practices, are physical and technical, and include techniques like Just in Time (JIT) and Value Stream Mapping (VSM), amongst others (Larteb *et al.*, 2015). SLP, however, are related to the activities of humans, such as customer management, teamwork, communication (Akmal *et al.*, 2022), leadership support, and employee involvement (Larteb *et al.*, 2015). LM is well known in the manufacturing sector where it has been applied to reduce the 7 + 1 wastes (Francis *et al.*, 2021). Hence, most LM studies seem to have focused mainly on the manufacturing sector, while the implementation in the service sector is few and far between (Marques *et al.*, 2022). Furthermore, the tools and techniques that are applicable in the service sector are not standard, making the implementation more difficult and the outcome less discernible and attainable. In contrast, the

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3 manufacturing sector, primarily, uses technical, well-known, and standard implementation
4 tools and techniques. Consequently, TLP are more readily applicable to the manufacturing
5 sector than the service sector, while SLP are more generally applicable everywhere,
6 particularly in the service sector, where the products are less tangible, and organizational
7 performance is more closely linked with customer perception (Blijleven *et al.*, 2019).
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9 10 1.1 Research relevance

11 Most known studies have focused on TLP, while little knowledge is available on how SLP
12 can be adopted to improve business performance (Akmal *et al.*, 2022). Although most studies
13 pointed out that TLP improves organizational performance, Larteb *et al.* (2015) indicated that
14 SLP are fundamental for accomplishing superior performance; hence, making the whole firm
15 Lean requires the implementation of SLP at every organizational level. Also, SLP are critical
16 as they sustain the Lean culture in organizations, and those organizations that pay attention to
17 SLP prove to be more successful than those that do not (Mamat *et al.*, 2015). Thus, the
18 implementation of TLP without proper implementation of SLP is the biggest contributor to
19 the non-achievement of Lean implementation goals (Bortolotti *et al.*, 2015).
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21
22 The use of SLP in the service industry is yet to be proven sufficiently as there is no specific
23 model that acts as a reference (Leite and Vieira, 2015). The challenge is to identify the best
24 Lean practices to use and how to implement them (Alsmadi *et al.*, 2012). Implementation of
25 LM in the service industry often results in resistance and proves difficult and haphazard, thus,
26 tailoring is required (Portioli-Staudacher, 2010; Tortorella *et al.*, 2021). This is due to the
27 challenge of attaining standardization in service products because of their heterogeneity
28 caused by high customer involvement (Blijleven *et al.*, 2019). Therefore, although LM is
29 gaining popularity, its impact on business performance in the service industries is limited.
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32 Investing in the service industry is critical as it is the backbone of many countries,
33 contributing the majority of the Gross Domestic Product (GDP). According to The World
34 Bank (2022), the service sector is the biggest contributor to the world's GDP, and in
35 developing countries like Brazil, Mexico, China, Djibouti and South Africa, it accounts for
36 59%, 58%, 53%, 77% and 62% of the GDP, respectively. In Zimbabwe, the service industry
37 is also foundational to the economy, accounting for 41% to 64% of the country's GDP
38 between 2016 and 2022 (Kuwaza, 2016; The World Bank, 2022). It is, therefore, vital to
39 assess how LM can enhance the business performance of such an important sector, especially
40 in developing countries. According to Gupta *et al.* (2016), developing nations are behind in
41 Lean research and have big populations with limited resources, therefore, they require more
42 research on improvement methodologies such as LM to eradicate non-value-adding activities
43 and reduce costs.
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45 46 1.2 Theoretical foundations

47 Service organizations aim to improve their business performance which can only be attained
48 through customer satisfaction, which in itself is predicated on employee satisfaction. Thus,
49 this study is linked to the service-profit-chain theory which emphasizes the need for
50 employee and customer satisfaction for enhanced performance improvements. Service sectors
51 deal directly with customers, hence, improvement in business performance can be realized
52 when there is an increase in customer satisfaction (Leite and Vieira, 2015). Thus, it may be
53 insufficient to report improvements in business performance without emphasizing the
54 mediating role of customer satisfaction. Most studies did not incorporate the role of customer
55 satisfaction in improved organizational performance. This may be because most such studies
56 were conducted in the manufacturing industry, where there is less direct interaction with
57 customers compared to the service sector. Since most service industries aim to improve sales
58 and profit, customer satisfaction will determine their success in the long run. Through
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customer satisfaction, organizations can improve their images, leading to improved market and business performance (Sajan *et al.*, 2017). The inclusion of the service-profit-chain theory also provided an opportunity to investigate the main theory of organizational performance in a way that has not been done in previously published articles, thereby contributing to work in both areas of lean manufacturing and performance management.

1.3 Research Gap

Several studies that investigated the effects of LM on business performance, even in the manufacturing industry, have produced diverse and inconclusive results, creating confusion among new adopters. Nawanir *et al.* (2013) stated that LM leads to significant improvement in business performance, whilst Panigrahi *et al.* (2023) and Ali *et al.* (2020) showed that such improvement is not significant. Ledón *et al.* (2018) noted that LM partially influences business performance, as some performance measures are improved whilst others are not. Also, Yang *et al.* (2011) reported that Lean has an impact on market performance for small enterprises, but not on large and medium enterprises. They also noted that improvement is realized in European countries, but not in non-European countries; and in developed countries, but not in developing countries. Furthermore, Blijleven *et al.* (2019) also noted that, compared to the manufacturing industry, it is more difficult to attain improved performance in the service industry from the application of Lean management, as the service industry is influenced more by greater customer involvement and lack of standardization. In conducting this research, the authors also considered the recommendation by Machingura *et al.* (2024b), that techniques applied in the manufacturing industry cannot be simply adopted in the service sector without further adaptation. Thus, the objectives of the research are:

- (1) To investigate the relationship between SLP and business performance in service industries;
- (2) To investigate the mediatory role of customer satisfaction on the relationship between SLP and business performance.

To the best knowledge of the authors, this is the first study that examines the impact of SLP on business performance in the service sector. Also, the study examined the mediatory role of customer satisfaction to clearly outline how it contributes to improvement in business performance, which is also missing in most studies. Most studies concentrated on understanding the direct impact of Lean on organizational performance and neglected the indirect, and hence, total effects. Machingura and Muyavu (2024) noted that some performance improvements are attained through indirect effects rather than the expected direct effects. This paper fills this gap by examining if customer satisfaction mediates the relationship between SLP and business performance and quantifies the extent of the mediation.

The paper consists of six sections; the literature review is in section 2, the methodology in section 3, and data analysis and results in section 4. The discussion is covered in section 5, whilst section 6 outlines the conclusion, implications, limitations and future areas of research.

2. Literature review

LM is a process improvement methodology that aims to reduce waste, which includes overproduction, over-processing, waiting, defects, excessive transportation, non-utilized talents, and excess inventory and motion (Maware and Parsley, 2022). These wastes are called non-value-adding activities and customers are not willing to pay for such activities, hence, they must be eliminated (Machingura *et al.*, 2024a) to attain benefits such as cost reduction, inventory reduction, and improvement in quality, sales, profitability, efficiency and flexibility (Suárez-Barraza *et al.*, 2021).

2.1 Lean management

Lean was introduced around 1990, and aims to eliminate waste by doing more with less (Farrukh *et al.*, 2020). It considers value-adding and non-value-adding activities of the processes and products (Indah *et al.*, 2020). The value-adding activities are what the customers need and are ready to pay for, whilst the non-value-adding activities are classified as waste (Machingura *et al.*, 2024b). LM is not only about doing better than the competitors, but also about going an extra step and striving to be the best in every product and process (Navarro, 2021). LM uses several practices, which are either TLP or SLP, to improve organizational performance and competitive advantage (Farrukh *et al.*, 2020).

2.1.2 Soft Lean Practices

Scholars have reported that most organizations prefer implementing TLP over SLP. However, several studies have noted that those organizations that chose not to pay attention to SLP significantly fail to achieve the intended improvements (Mamat *et al.*, 2015). Thus, there is a need to understand the relationship among these practices, and how such relationships affect the behavior of employees and the firms' ability to improve their performance (Galeazzo and Furlan, 2018). As a result, many organizations are realizing the importance of SLP, hence, they have started integrating it with TLP and other approaches. A study in the textile industry by Nagaraj *et al.* (2019) noted that Lean can be integrated with other approaches such as human factors and ergonomics, leading to improvement in the quality of life of workers and operational performance. Research by Negrão *et al.* (2020) in Brazilian manufacturing companies reported that SLP like HRM, supplier feedback, customer involvement, and supplier development, positively impact business performance. However, the adoption of SLP in the service industries has not been fully studied, and little has been reported, hence, requiring deeper exploration. Motivated by this gap, this research seeks to investigate the impact of SLP on the business performance of service organizations, especially as mediated by customer service, which is key in this industry.

2.2 LM in the service industry

Although Lean practices originated from Toyota automobile manufacturing, it is now being adopted in other areas like the service sector including healthcare, banks, and public offices, with the same goal of reducing waste (Morales-Contreras *et al.*, 2020), and improving value for their customers. Cudney and Elrod (2011) noted that Information Technology (IT), finance, government, and military services have had little involvement in Lean implementation. Also, Portioli-Staudacher (2010) indicated that third-party logistics companies implement LM more compared to insurance companies and banks. According to Ramori *et al.* (2021), the adoption of LM in healthcare services is increasing, and those companies that can fully adopt it present themselves with better opportunities to increase patient satisfaction by creating more value using less resources. Vaishnavi and Suresh (2020) further stated that healthcare industries can integrate LM with Six Sigma for better improvement opportunities. Blijleven *et al.* (2019) highlighted performance rewards, utilization of Lean practices, and communication, as the critical success factors for implementing LM in the IT industry, whilst Ajmera and Jain (2020) considered leadership, teamwork and culture as some of the factors influencing the adoption of LM in the service industry.

2.2.1 SLP in the service industry

According to Alsmadi *et al.* (2012), service organizations should be much more interested in SLP such as customer involvement, compared to TLP like Total Productive Maintenance (TPM). In addition, the study also noted that the adoption of SLP in United Kingdom service

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3 industries has a positive impact on organizational performance. A study across various
4 industries, including services, showed that SLP are key to improving Lean performance
5 (Nagaraj and Jeyapaul, 2021). The study added that because organizations concentrate on
6 TLP and sideline SLP, it affects the quality of life of workers, which further hampers
7 performance improvement. Areiqat and Zamil (2019) noted that the adoption of SLP such as
8 knowledge management, decision making, and continuous improvement in a university
9 environment reduces organizational costs. Tortorella *et al.* (2023) stated that SLP shows a
10 positive relationship with a firm's resilience, leading to improved competitive advantage.
11 Lizarelli *et al.* (2023) pointed out that SLP such as Lean leadership and continuous
12 improvement, are positively related to economic, social and environmental sustainability.
13 Vignesh *et al.* (2018) noted that successful results are not achieved by adopting TLP only, but
14 SLP as well. Sorooshian and Ali (2017) noted that neither SLP nor TLP should be prioritized
15 more than the other as their influence is the same, hence, they should be adopted
16 simultaneously to attain improvement in sustainable performance.
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20 2.3 Lean Management and service performance

21 Through LM, organizations have the potential to improve business performance by
22 continuously enhancing the services' and goods' quality (Blijleven *et al.*, 2019). When these
23 Lean practices are combined and considered as a system, they benefit the whole company by
24 eliminating inefficiencies and imperfections. According to Leite *et al.* (2020), the benefits of
25 Lean adoption in the healthcare sector include cost reduction, reduced medication waste,
26 reduced queues, increased patient satisfaction, enhanced safety, and time-saving. The benefits
27 in the financial sector include reduction in costs, reduced cycle time and delays, increased
28 profits, and improved quality of services (Vashishth *et al.*, 2019). Leite and Vieira (2015)
29 reflected that when Lean practices are correctly applied, large economic and financial
30 improvements are attained. They further discussed the benefits of LM in the Brazilian service
31 sector, which include operational cost reduction, increased flexibility, increased delivery
32 speed, elimination of service costs, increased revenue, improved quality, reduced inventory,
33 and improved customer satisfaction. Kanakana (2013) noted that hospitals, higher education,
34 and financial institutions improved their competitiveness by adopting Lean practices.
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38 2.4 Theoretical framework

39 This study adopts the framework of the service-profit-chain theory, which argues that
40 profitability is driven by customer loyalty, while loyalty is influenced by customer
41 satisfaction (Yee *et al.*, 2009). Customer satisfaction is driven by employee satisfaction and
42 productivity. Without employee satisfaction, it is difficult to satisfy the customers, attain
43 sustainable profitability, and improve business performance (Hogreve *et al.*, 2017). Employee
44 productivity is influenced strongly by the enabling environment of the business, which
45 includes organizational policies and management leadership (Haskett *et al.*, 1997). It is those
46 management initiatives, such as interaction with the employee, that motivate them to create
47 value for customers, leading to the company's sustained profitability. Thus, SLP, which are
48 related to employee and management attributes, are what influence customer satisfaction and,
49 hence, the performance of the business. When there is a break in this chain, there is likely to
50 be a failure in meeting the organization's expectations of attaining business performance
51 objectives. Therefore, organizations must strive to identify all the weak links in this chain and
52 strengthen them as much as possible. In this research, leadership attributes have been
53 summed up in Managerial Human Lean Practices (MHLP), and the employee attributes in
54 Employee Human Lean Practices (EHLP), which together constitute the lower-level factors
55 of SLP, and affect customer satisfaction in our model.
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2.5 Hypothesis development

A higher-order model was created to examine the effects of SLP on business performance. SLP and business performance were higher-order constructs. The lower-order constructs for SLP were customer management, MHLP and EHLP. SLP are centered on human activities, and they include human resource management, leadership commitment and customer management (Larteb *et al.*, 2015). The independent variable was SLP, whilst the dependent variable was business performance. Customer satisfaction and continuous improvement were the mediating variables. In the service industry, organizations have a direct interaction with the customers, making customer satisfaction and continuous improvement very important. Several studies have reported that continuous improvement (Yasar *et al.*, 2019; van Assen, 2020; Lim *et al.*, 2022) and customer satisfaction (Caruana, 2002; Chi and Gursoy, 2009; Vanniarajan, 2011; Iriqat and Daqar, 2018) are important mediating variables towards attaining improved performance; hence, the adoption of these variables to examine their mediatory effects. Hernandez-Matias *et al.* (2019) noted that SLP can be divided into MHLP and EHLP, and this motivated the adoption of these practices, with attention also given to customer management. The first-order constructs for business performance were profitability and sales. The conceptual model is shown in Figure 1.

The success of service industries largely depends on customer satisfaction. Hence, SLPs such as MHLP, EHLP and customer management play a big role towards customer satisfaction. Employees implement changes after LM adoption and create interactive relationships with customers to understand their requirements (Yadav *et al.*, 2020). They are also responsible for addressing the challenges that arise on the shop floor. In addition, management should strategize and develop ways to put customers first, thereby improving customer satisfaction. Training and educating employees can equip them with essential skills for better customer management (Basu *et al.*, 2018). Customer management addresses customer complaints, builds relationships with customers, and improves customer satisfaction (Li *et al.*, 2006). Madhani (2020) noted that one of the aims of LM is to satisfy the customer. Thus, we can hypothesize that;

H1: SLP positively influences customer satisfaction.

Various studies have reported the effect of LM on organizational performance. Maware and Adetunji (2019) wrote that the adoption of both TLP and SLP positively impacts the operational performance of Zimbabwe's manufacturing firms. Hernandez-Matias *et al.* (2019) concluded that the adoption of SLP enhances operational performance in Spanish manufacturing industries, and if organizations ignore SLP, the implementation process is likely to fail. Arumugam *et al.* (2022) found out that the adoption of SLP, such as Lean leadership and Lean training, leads to improved operational, employee and financial performance in Indian Small and Medium Enterprises (SMEs). Thus, we hypothesize that;

H2: SLP positively influences business performance.

SLP such as people involvement have been acknowledged as tools for continuous improvement. Thus, management should communicate the Lean objectives to the employees to influence their attitude towards continuous improvement (van Assen, 2018). They need to encourage Lean thinking as SLP advocate for the engagement of employees, thereby supporting the firm's continuous improvement efforts (Costa *et al.*, 2019). Incorporating employees through the expansion of their responsibilities and involving them in all Lean programs can motivate and encourage them to be committed to continuous improvement initiatives (Hirzel *et al.*, 2017). As a result, by adopting SLP, waste is identified and

eliminated, leading to continuous improvement (Madhani, 2020). Thus, we can hypothesize that;

H3: SLP positively influences continuous improvement.

Laureani and Antony (2019) highlighted the need for organizations to focus on continuous improvement to attain better quality and operational excellence, hence **improving** organizational performance. According to Yang *et al.* (2011), continuous improvement through Lean practices reduces setup time and inventory levels, and improves throughput time, leading to enhanced market performance. van Assen (2018) found that continuous improvement positively influences performance. Furthermore, Bazajiah (2023) noted that a continuous improvement culture increases the efficiency of companies in their activities and operations. Carvajal-Arango *et al.* (2019) stated that the adoption of continuous improvement tools of SLP has the potential to enhance organizational performance. Thus, the continuous improvement efforts by organizations implementing Lean supports improvement in the performance of organizations (Januszek *et al.*, 2023). Thus, we hypothesize that;

H4: Continuous improvement positively influences business performance.

The goal of every business is to satisfy the customers and maximize profits. Nawanir *et al.* (2013) noted that LM encourages higher customer satisfaction through continuous improvement initiatives. According to Farris *et al.* (2009), strategies for continuous improvement increase employee dedication, which boosts the organization's success through customer satisfaction. Karlsson and Mohammed (2015) noted the benefits of continuous improvement, which include quality improvement, reduced transaction time, and reduction in errors, and these have the potential to increase customer satisfaction. The role of continuous improvement is to prevent waste and reduce costs, leading to customer satisfaction (Soita, 2016). Stelson *et al.* (2017) wrote that continuous improvement aims to maximize the benefits to the customer by eliminating those elements that harm the goal of service industries. Studies by Koyal *et al.* (2018) and Mezher and Mdlool (2022) concluded that continuous improvement has a positive influence on customer satisfaction. Hence, we can hypothesize that;

H5: Continuous improvement positively influences customer satisfaction.

There is a growth in customized services, making customer relations crucial for the survival of organizations (Madhani, 2020). Traditionally, the competition was centered on areas like cost reduction, however, these days, organizations need a customer-driven approach, making customers an integral part of their supply chain (Chavez *et al.*, 2015). Customer education and after-sales services determine how customers perceive the quality of services (Nguyen *et al.*, 2023). Determining customers' needs, obtaining feedback from customers, and customer involvement make organizations differentiate themselves from competitors, attain customer loyalty, expand the value provided to their customers, and improve business performance (Slack *et al.*, 2020). A decrease in customer satisfaction and loyalty results in decreased business performance and profits (Abdirad and Krishnan, 2022). Therefore, we can hypothesize that;

H6: Customer satisfaction positively influences business performance.

Customer satisfaction is the key to attaining improved business performance. The improvement methodologies may fail to attain the intended goal if there is low customer satisfaction. If customers are satisfied, they resist other options from the competitors and there are high chances for the organization to retain those customers, leading to repeated

purchases (Santouridis and Trivellas, 2010). According to Chi and Gursoy (2009) and Gursoy (2009), the relationship between employee involvement and business performance is mediated by customer satisfaction. Vanniarajan (2011) shows that customer satisfaction mediates the relationship between customer management initiatives such as service quality, and performance measures such as repeated purchases. In addition, Caruana (2002) also emphasized that the relationship between service quality and service loyalty is indirect, mediated by customer satisfaction. Therefore, we can hypothesize that;

H7: The relationship between SLP and business performance is mediated by customer satisfaction.

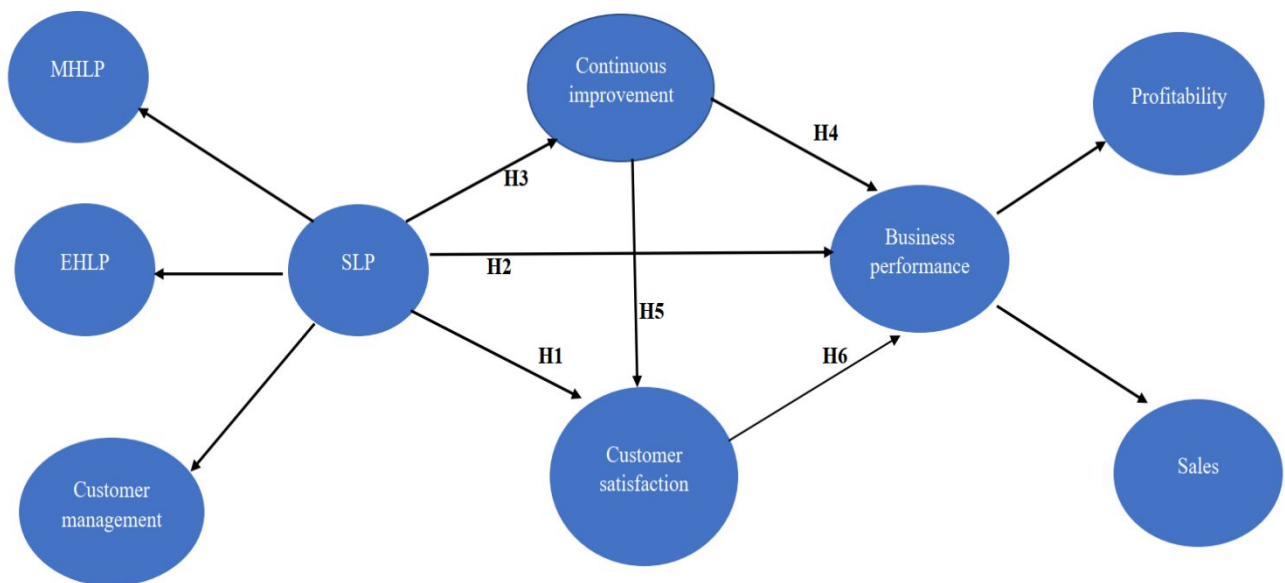


Figure I: Conceptual model

3. Methodology

3.1 Development of the questionnaire

A questionnaire was developed to conduct the survey on how SLP adoption influences business performance. This questionnaire had three sections: the general company information was covered in section 1, while items related to the level of adoption of SLP were outlined in section 2, and the business performance items in section 3. To improve the questionnaire's validity, questions derived from literature were used (Panigrahi *et al.*, 2023) (see the appendix). Many authors used five-point Likert scales for all their constructs, including the performance measures, and hence in this study, we also adopted a five-point Likert scale, with 1 denoting strongly disagree and 5 strongly agree. Pretesting of the questionnaire was done by distributing it to seven experts from academia and service industry to enhance its validity (Belhadi *et al.*, 2020). These experts consisted of three university professors and four service industry managers with more than 10 years of experience in LM. The goal was to discard irrelevant questions, check the grammar and spelling, improve the logic of the questionnaire, modify some questions, and add other relevant questions (Belekoukias *et al.*, 2014). The resulting modified questionnaire was used in the survey.

3.2 Data collection

Questionnaires were randomly distributed (Yadav *et al.*, 2019) to Zimbabwean service organizations that follow lean practices. Printed copies and Google form links were used. A total of 702 questionnaires were distributed to employees of service industries that are registered with the Zimbabwe National Chamber of Commerce (ZNCC). To improve the response rate, follow-ups were done using WhatsApp messaging, email and telephone calls. Initially, 263 questionnaires were returned and 3 were rendered invalid because they were incomplete, resulting in 260 valid responses, and a response rate of 37%. In Structural Equation Modelling (SEM), the 10 times rule is recommended in determining the minimum sample size (Hair *et al.*, 2017). A sample of 260 is way above this minimum value of 110, hence, acceptable.

The responses were anonymous, thus respecting the privacy and response integrity of the participants (Belekoukias *et al.*, 2014). This also helped in reducing bias as recommended by Saunders *et al.* (2009) and Belekoukias *et al.* (2014). The organizations that participated in the study belong to the following sectors: finance, pharmaceutical, retail, real estate, IT, insurance, education, petroleum, transport, media, hospitality, and healthcare services. Table I shows the distribution of the respondents across industries.

Table I: Profile of respondents

Type of industry	Number of respondents	%
Retail	154	59.2
Hospitality	16	6.2
Real estate	8	3.1
Petroleum	16	6.2
Information technology	14	5.4
Insurance	6	2.3
Pharmaceutical	10	3.8
Education	12	4.6
Transport	8	3.1
Media	4	1.5
Finance	4	1.5
Healthcare services	8	3.1

Personnel occupying higher positions were invited to participate in the study as they were considered more knowledgeable about the processes. 8.5% of the participants were directors, 7.7% were Chief Executive Officers (CEOs), 57.7% were managers, 2.3% were engineers, 18.5% were supervisors and 5.3% were administrative officers. 89.2% of these respondents had over 5 years of experience in their present position, while 10.8% indicated that they have 0-5 years. According to Huo *et al.* (2019), this level of experience is sufficient to respond to the survey.

3.3 Non-response bias

The early and late response method outlined by Armstrong and Overton (1977) was utilized to examine non-response bias. The last 20 and first 20 responses were compared using 5 randomly chosen items of the questionnaire. The t-test showed no significant difference at a 0.05 significance level, indicating the absence of non-response bias (Chavez *et al.*, 2022).

3.4 Common method bias

Harman's single-factor test was used to assess the common method bias as outlined by Tehseen *et al.* (2017). The principal component analysis produced nine distinct factors with a

total variance of 60%. The first factor had 34% of the variance, which is lower than 50%. This indicates that there is no common method bias as no single factor appeared, and also, the first factor did not have most of the variance.

4. Data analysis

The SEM function of Smart PLS 3 was used to analyze the data collected as described in the following sections.

4.1 Measurement scale assessment

It was important to examine the measurement model and determine if the data was suitable for further analysis. Cronbach's alpha and composite reliability were used to evaluate the internal reliability and consistency of the measurement scale (Hair *et al.*, 2017). All the values were greater than 0.7 and less than 0.95, representing high internal consistency and reliability. The Average Variance Extracted (AVE) was employed to evaluate the convergent validity, where values above 0.5 are accepted (Hair *et al.*, 2021). The values obtained were all greater than 0.5, hence, the results were satisfactory. Table II shows the reliability and validity results.

Table II: Construct reliability and validity

	Cronbach's alpha	Composite reliability	AVE
Business performance	0.881	0.914	0.68
Continuous improvement	0.732	0.833	0.555
Customer management	0.823	0.876	0.586
Customer satisfaction	0.891	0.917	0.649
EHLP	0.848	0.888	0.57
MHLP	0.858	0.891	0.54
Profitability	0.903	0.928	0.722
SLP	0.911	0.923	0.504
Sales	0.853	0.902	0.697

The discriminant validity was assessed using the Fornell-Larcker criterion, which compares the AVE square roots to the constructs' correlations (Fornell and Larcker, 1981). The AVE square roots were higher than their correlations with other constructs, therefore, discriminant validity was established (Machingura *et al.*, 2024c). Table III shows the Fornell-Larcker criterion results.

Table III: Fornell-Larcker criterion

	BP	CI	CM	CS	EHLP	MHLP	Profitability	SLP	Sales
BP	0.825								
CI	0.474	0.745							
CM	0.408	0.513	0.766						
CS	0.475	0.626	0.486	0.805					
EHLP	0.259	0.439	0.535	0.406	0.755				
MHLP	0.344	0.583	0.642	0.566	0.626	0.735			
Profitability	0.653	0.407	0.393	0.386	0.217	0.234	0.85		
SLP	0.389	0.608	0.611	0.575	0.638	0.607	0.317	0.710	
Sales	0.384	0.454	0.366	0.464	0.237	0.334	0.687	0.362	0.835

BP - Business Performance, CI - Continuous improvement, CM - Customer management and CS - Customer satisfaction

4.2 Model assessment

Collinearity among the factors was determined using the Variance Inflation Factor (VIF). VIF values ranging from 0.2 to 5 indicate no collinearity problem (Machingura *et al.*, 2024b). Consequently, the VIF values ranged from 1.437 to 2.95, and they were considered satisfactory. The coefficient of determination (R^2) values above 0.26 are regarded as large, 0.13 as medium, and 0.02 as low (Cohen, 1988). As shown in Figure II, the R^2 values were all greater than 0.26, indicating large effects.

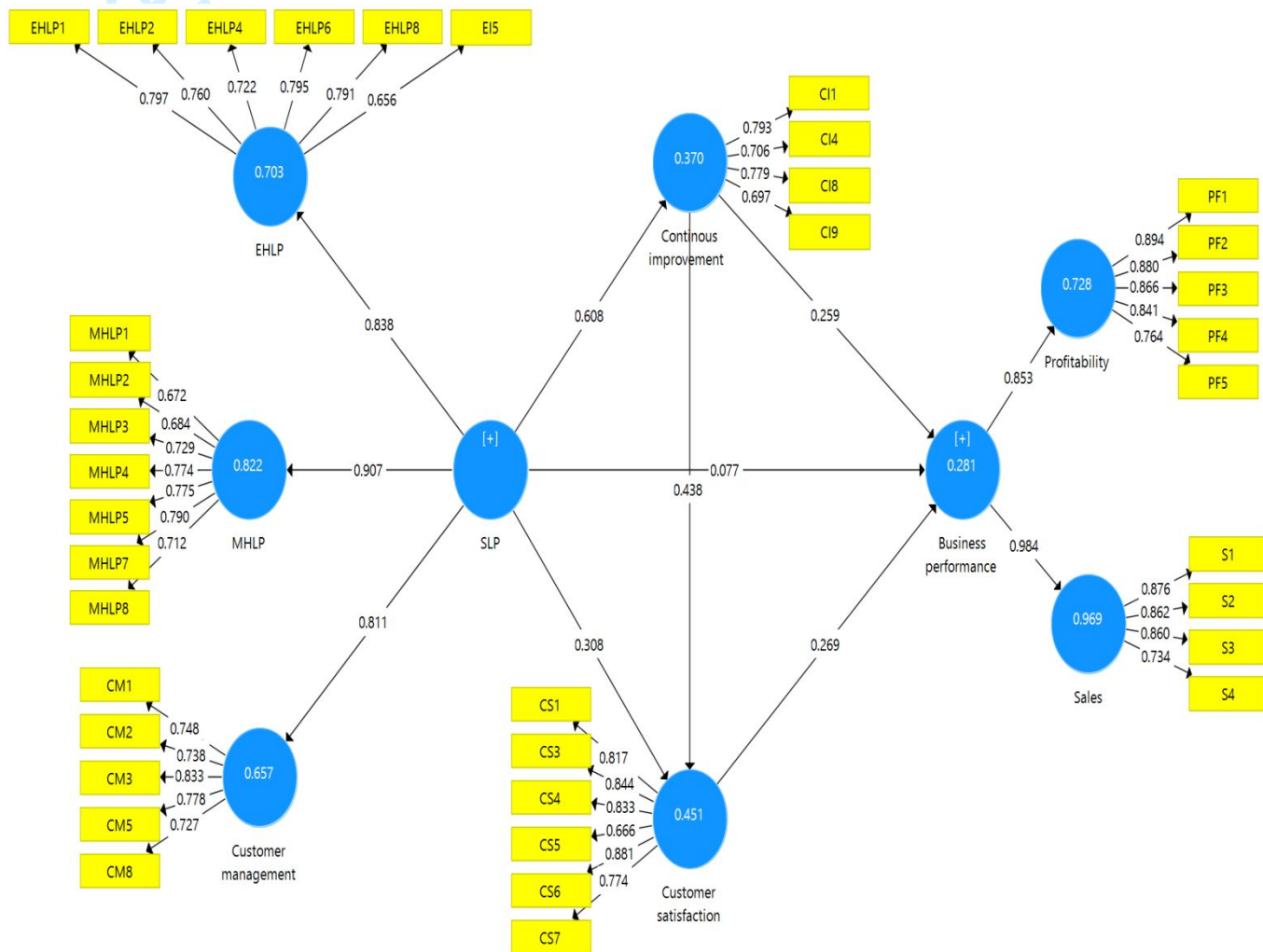


Figure II: SEM model

The model was further evaluated using the effect size (f^2), where 0.35 represents large effect, 0.15 medium effect, and 0.02 small effect (Cohen, 1988). As shown in Table IV, most of the relationships had large effects except for the relationship between SLP and business performance which had a small effect. To further evaluate the model's accuracy, the model's predictive power was determined using Stone-Geisser's (Q^2) values. As highlighted in Table IV, all the Q^2 values were above 0, hence the factors' predictive relevance was high (Maware and Adetunji, 2020).

Table IV: Effect size and Stone-Geisser's values

	f^2	Q^2
Business performance	0.370	0.969
Continuous improvement	0.370	0.969
Customer satisfaction	0.451	0.969

Continuous improvement	0.356		0.421	0.194
Customer satisfaction	0.362			0.283
SLP	0.05	0.586	0.385	
Business performance				0.183

To determine whether the proposed hypotheses are significant or not, bootstrapping was performed adopting a resample of 5000 runs. For a hypothesis to be considered valid, the *t*-statistics should be above 1.96 and the *p*-value below 0.05 (Choi *et al.*, 2024). As shown in Table V, H1, H3, H4, H5, and H6 were supported as indicated by their *p* values and *t*-statistics. However, the direct relationship between SLP and business performance was not significant. Hence, it was important to assess the indirect impacts.

Table V: *p* values, *t* statistics and decision on hypotheses

Effect of	On	<i>t</i> statistics	<i>p</i> values	Decision on hypotheses
CI	BP	1.968	0.047	H5 is supported
CI	CS	3.927	0.000	H4 is supported
CS	BP	2.091	0.037	H6 is supported
SLP	BP	0.581	0.562	H2 not supported
SLP	CI	7.439	0.000	H3 is supported
SLP	CS	2.479	0.014	H1 is supported

4.3 Mediation analysis

The indirect impacts were used to examine the indirect relationship between SLP and business performance, and the mediatory role of customer satisfaction. As indicated earlier, the direct relationship between SLP and business performance is not significant, but as shown in Table VI, the indirect relationship through customer satisfaction is significant, hence the type of mediation is indirect only mediation. Thus, for improvements in business performance to be realized, organizations should invest in customer satisfaction.

Table VI: Indirect impacts

	<i>t</i> statistics	<i>p</i> values	Decision on indirect relationship
SLP -> CS-> BP	1.984	0.047	Supported
SLP -> CI -> CS -> BP	2.013	0.042	Supported
SLP -> CI -> BP	2.083	0.039	Supported

To understand the magnitude of the mediation, the Variance Account Factor (VAF) is used, where values greater than 20% show partial mediation while those above 80% indicate full mediation (Wong, 2016). VAF is calculated using the formula;

$$VAF = \frac{\text{Indirect effect}}{\text{Total effect}}$$

where the total effect is the sum of the direct effect and indirect effect.

As shown in Table VII, the calculated VAF was 66.67%, showing partial mediation. Since the direct effect is not significant, it suggests that there is another mediating construct other than customer satisfaction. The authors decided to explore whether continuous improvement mediates the relationship between SLP and business performance. The indirect impacts in Table VI show that the relationship is supported. Likewise, the VAF was found to be 74.84%,

showing that continuous improvement also partially mediates the relationship between SLP and business performance. Thus, for organizations to fully benefit from Lean implementations, it is essential to pay close attention to customer satisfaction and continuous improvement.

Table VII: Variance Account Factor values

	Direct effect	Indirect effect	Total effect	VAF
Effect of SLP on business performance with customer satisfaction as a mediator	0.077	0.154	0.231	0.667
Effect of SLP on business performance with continuous improvement as a mediator	0.077	0.229	0.306	0.748

5. Discussion

The research aimed to assess the impacts of implementing SLP (EHLP, MHLP and customer management) on business performance, and to investigate the mediatory role of customer satisfaction on this relationship. The results indicated that the direct relationship between SLP and business performance is not supported. This agrees with some studies conducted in the manufacturing industry (Panigrahi *et al.*, 2023; Ali *et al.*, 2020). SLP was found to positively impact customer satisfaction, while customer satisfaction had a positive influence on business performance. Thus, the relationship between SLP and business performance is indirect, mediated by customer satisfaction, suggesting that improvement in business performance is not directly attained through the adoption of SLP only, but by simultaneous focus on customer satisfaction.

Companies that implement SLP without paying attention to customer satisfaction may not enjoy the intended benefits. In service industries, organizations deal directly with the customers, making customer satisfaction essential. This agrees with Leite and Vieira (2015) who noted that enhanced business performance in the service sector can only be realized when there is an improvement in customer satisfaction. The results are also supported by Keitany and Riwo-Abudho (2014), who acknowledged that LM helps organizations attain customer satisfaction, thereby leading to improved performance. Pozo *et al.* (2017) also indicated that if organizations implement LM, they increase their chances of meeting customer requirements, leading to an improvement in customer satisfaction, hence, increasing customer loyalty and organizational performance.

Interestingly, continuous improvement was also found to mediate the relationship between SLP and business performance, hence, it complements the mediation effect of customer satisfaction. Therefore, for enhanced business performance improvement, both customer satisfaction and sustained effort in continuous improvement are critical. Some studies might have bunched these constructs, thereby missing their complementary effects.

Although this research did not find a direct relationship between SLP and business performance, the overall goal, which is improving organizational performance, agrees with most studies done in manufacturing industries such as Hernandez-Matias *et al.* (2020) and Maware and Adetunji (2019). This also agrees with the study done by Alsmadi *et al.* (2012) that concluded that LM positively influences organizational performance, and the margin of the effect is the same for both manufacturing and service sectors. Yadav *et al.* (2019) found that the adoption of both TLP and SLP leads to improved operational performance. Also,

Arumugam *et al.* (2022) stated that both TLP and social Lean practices improve organizational performance.

The outcomes showed that the adoption of LM positively impacts customer satisfaction and continuous improvement. The results agree with several studies that found that LM reduces waste such as unnecessary motion, waiting and non-utilized people, through continuous improvement (Huo *et al.*, 2019; Leong *et al.*, 2019; Zekhnini *et al.*, 2022). EHLP such as cross-functional training enables employees to assist customers with different demands, requests, and inquiries, while allowing employees to solve problems on shop floor also reduces customer waiting time. Moreover, MHLP such as providing resources and taking improvement suggestions seriously enables organizations to continuously improve.

The results validate the service-profit-chain theory that customer service is the key link between SLP and profitability, confirming that it is the indirect path through customer satisfaction that actually impacts business performance. Thus, an improvement in business performance is attained through customer focus by both employees and management. Since management is responsible for creating a good working environment for the employees, it follows from the service-profit-chain theory, that management works together with the employees to improve their productivity and create initiatives to improve customer satisfaction, and hence, business performance.

6. Conclusion

The research explored the impacts of implementing SLP in the service industries of an emerging country. It also demonstrated how customer satisfaction mediates the relationship between SLP and business performance. To test the proposed hypotheses, data gathered from the Zimbabwean service industry was analyzed through SEM using Smart PLS 3. Results indicated that the direct relationship between SLP and business performance is not supported; however, the mediated relationships through customer satisfaction and continuous improvement were established. Thus, service organizations seeking to improve their business performance through the implementation of SLP should complementarily focus on customer satisfaction and continuous improvement initiatives.

6.1 Research implications

This work adds to the body of knowledge by demonstrating that Lean benefits are not attained through TLP only, but also SLP. It also explores the impact of SLP on business performance in the service sector, which seems to have been less studied compared to the manufacturing sector. Hence, management should be aware that enhanced business performance is attained by adopting SLP. Therefore, by incorporating SLP, organizations will increase the chances of attaining their intended performance goals.

SLP comprises several factors, which include MHLP, EHLP and customer management, hence, resources need to be appropriately allocated in these areas for successful results. Based on the path weight, MHLP is the most important, followed by EHLP and lastly customer management. Hence, organizations should prioritize MHLP activities if resource rationing becomes necessary. The mediatory influence of customer satisfaction indicates that customer dissatisfaction may affect the attainment of improved business performance, even if SLP are implemented. Therefore, managers should not focus on implementing SLP only, but they must comprehend what their clients' needs are, react to their queries and satisfy them. They should understand the role of customers in improving business performance, as most SLP require their support and commitment. Thus, management can set goals and encourage workers to adopt SLP. They should establish initiatives for better customer management,

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2
3 cultivate a close connection with these customers, and work with them to comprehend their
4 requirements and expectations.
5

6 Government and other stakeholders should be aware that SLP can help in improving the
7 business performance of the service organizations. Hence, they should support companies
8 with the resources required for the successful implementation process, since industry success
9 helps to overcome national economic challenges. There is a need to educate the Zimbabwean
10 organizations about LM to make them understand its benefits, and urge them to implement it.
11

12 *6.2 Research limitations and future research opportunities*

13 The study demonstrated the impact of implementing SLP on business performance in a
14 service industry and did not consider other industries such as agriculture and construction.
15 Such research can be extended to these industries and the results compared with those from
16 this study. This research focused on understanding the improvement using business
17 performance measures, hence, it can be insightful to include social and environmental
18 performance measures to further create a clearer picture of the impact of SLP on sustainable
19 performance. Although the service sector seems more suited to SLP, examining the integrated
20 impact with TLP can yield interesting results. The research was done in Zimbabwe, a
21 developing country, and since the socio-economic characteristics differ from one country to
22 another, a comparative study of other nations with different socio-cultural and economic
23 differences may be elucidating.
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Appendix

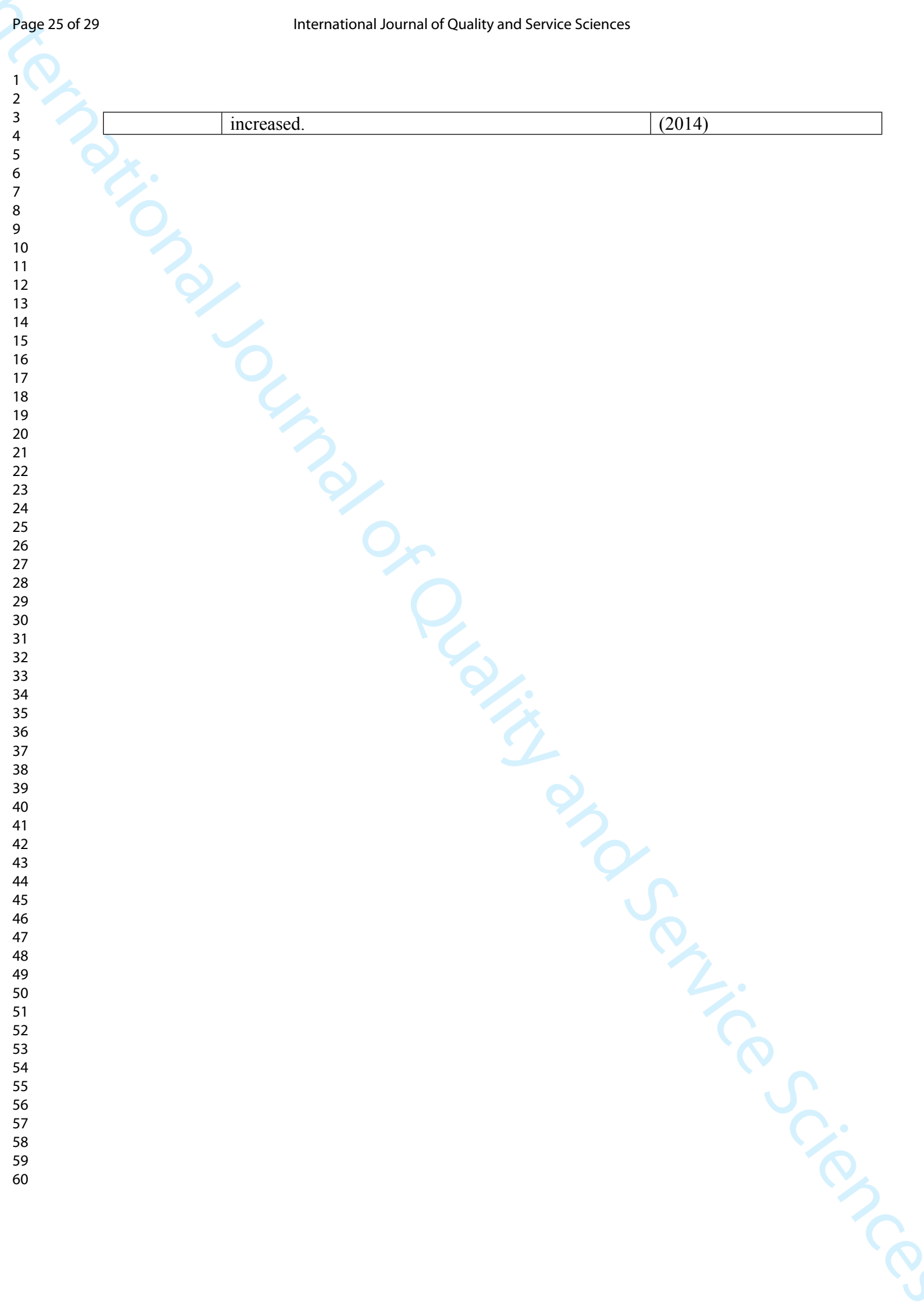
Measurement scale

Variable	Items	Author
EHLP	Our workers undergo cross-functional training.	Iranmanesh <i>et al.</i> (2019), Yadav <i>et al.</i> (2018)
	Suggestions of the team members are considered before making decisions.	Machingura <i>et al.</i> (2024b)
	Our workers are involved in continuous improvement efforts.	Iranmanesh <i>et al.</i> (2019), Bevilacqua <i>et al.</i> (2016)
	My firm has multifunctional (multiskilled) workers.	Machingura <i>et al.</i> (2024b)
	My firm gives workers a broader range of tasks.	Iranmanesh <i>et al.</i> (2019)
	The employees are encouraged to work together rather than competition.	Abdallah and Phan (2007), Dal Pont <i>et al.</i> (2008)
MHLP	Our management takes all improvement suggestions seriously.	Abdallah and Phan (2007), Wickramasinghe and Wickramasinghe (2017)
	Leadership develops processes that ensures an understanding of the work.	Yilmaz <i>et al.</i> (2016)
	Our leadership develop processes to teach employees about the work to be done and the expected results.	Machingura <i>et al.</i> (2024b)
	Our leadership develop ways to teach employees how to solve problems together.	Machingura <i>et al.</i> (2024b)
	Our leadership provides resources required for continuous improvement.	Yilmaz <i>et al.</i> (2016)
	Our management are committed to performance improvement.	Abdallah and Phan (2007), Wickramasinghe and Wickramasinghe (2017)
	Our leadership encourage activities that improve customer satisfaction.	Yilmaz <i>et al.</i> (2016)
Customer Management	We systematically and regularly measure customer satisfaction.	Samson and Terziovski, 1999; Li <i>et al.</i> , 2006;

		Chavez <i>et al.</i> , 2015
	Customer needs and expectations are effectively disseminated and understood throughout the workforce.	Samson (1997)
	We have an effective process for resolving customers' complaints.	Li <i>et al.</i> , 2006;
	Customers give feedback on quality and delivery performance.	Chavez <i>et al.</i> 2015
	We development processes to addresses the needs of customers.	Samson and Terziovski
Continuous improvement	Our decision-making process considers all alternatives, discussing the problems and potential solutions together to seek consensus.	Samson and Terziovski (1999)
-	Continuous improvement makes our performance a moving target, which is difficult for competitors to attack.	Peng <i>et al.</i> 2010
	Many of our products/services have been improved in the recent past.	Peng <i>et al.</i> 2010
	We have received recent compliment and recognition for improving our products/services/processes.	Nawanir <i>et al.</i> (2013)
Customer satisfaction	Our customers are satisfied with the quality of our products/ services.	Nawanir <i>et al.</i> (2013)
	Our customers are satisfied with our company's delivery lead time.	Li <i>et al.</i> , 2006; Nawanir <i>et al.</i> (2013)
	Our customers are satisfied with our company's response to enquiries.	Nawanir <i>et al.</i> (2013)
	Customers are satisfied with our products/ services competitive prices.	Nawanir <i>et al.</i> (2013)
	We are able to offer prices as low or lower than our competitors.	Ghobakhloo and Hong (2014)
	We have reduced the number of customer complaints.	Ghobakhloo and Hong (2014)
	Our flexibility increased (variety and new products/services, delivery).	Machingura <i>et al.</i> (2024b)
Profitability	Our profit margin has increased.	Nawanir <i>et al.</i> . (2013); Chavez <i>et al.</i> , 2015
	Our return on investment has increased.	Yang <i>et al.</i> (2011); Chavez <i>et al.</i> , 2015
	Our return on assets has increased.	Yang <i>et al.</i> (2011)
	Our revenue growth rate has exceeded our competitors.	Nawanir <i>et al.</i> (2013)
	Our profitability has exceeded our competitors.	Nawanir <i>et al.</i> (2013)
Sales performance	Our market share has increased.	Nawanir <i>et al.</i> (2013); Chavez <i>et al.</i> , 2015
	Our sales growth has been outstanding.	Nawanir <i>et al.</i> (2013); Chavez <i>et al.</i> , 2015
	Our market share growth has exceeded our competitors.	Nawanir <i>et al.</i> (2013)
	The percentage sales of new products/ services has	Ghobakhloo and Hong

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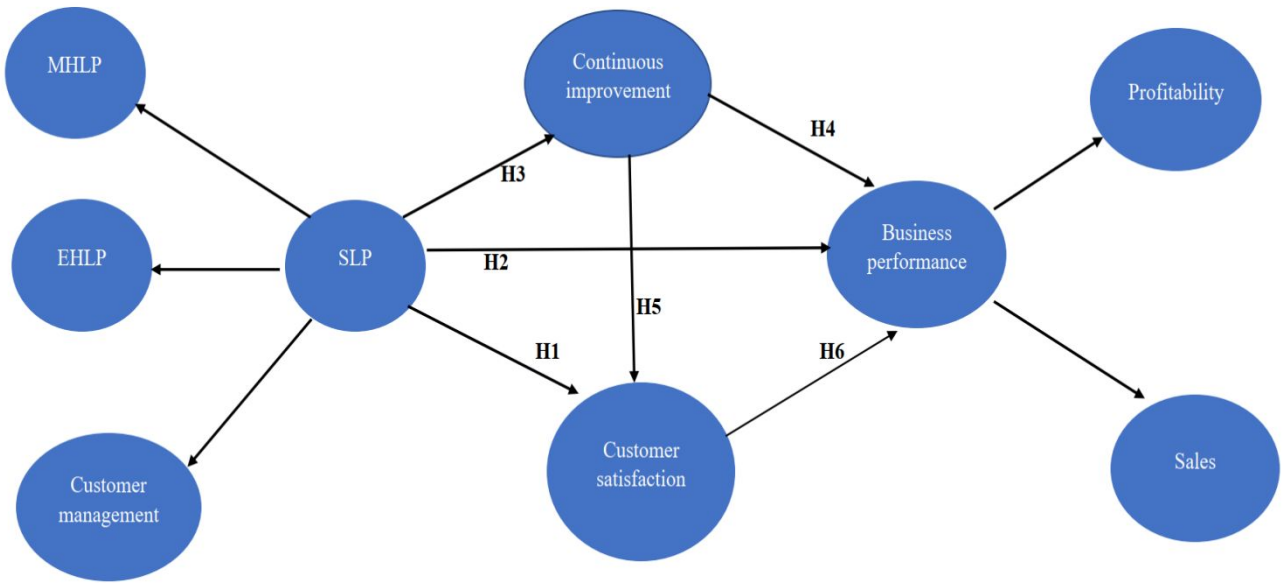


Figure I: Conceptual model

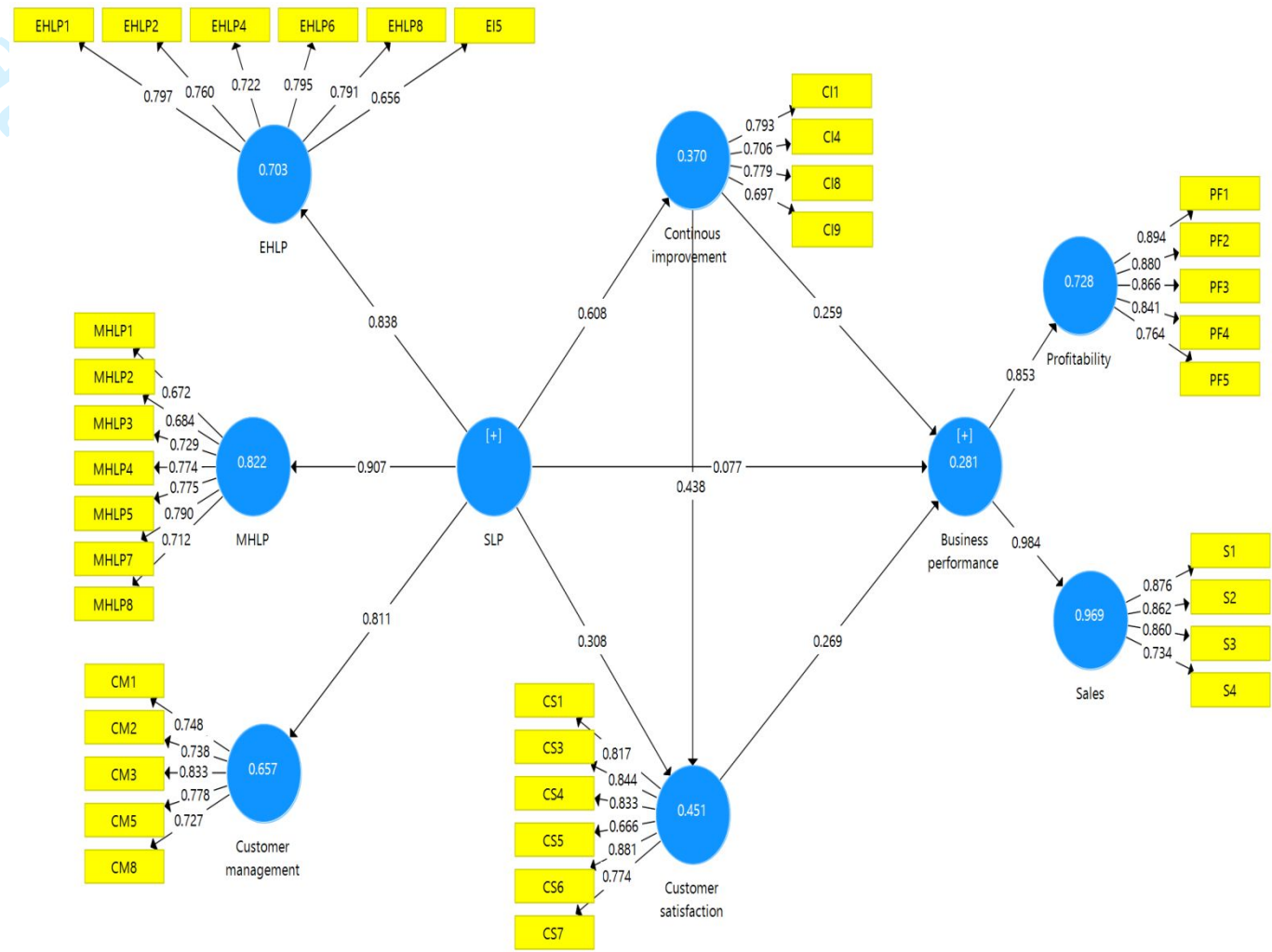


Figure II: SEM model

Table I: Profile of respondents

Type of industry	Number of respondents	%
Retail	154	59.2
Hospitality	16	6.2
Real estate	8	3.1
Petroleum	16	6.2
Information technology	14	5.4
Insurance	6	2.3
Pharmaceutical	10	3.8
Education	12	4.6
Transport	8	3.1
Media	4	1.5
Finance	4	1.5
Healthcare services	8	3.1

Table II: Construct reliability and validity

	Cronbach's alpha	Composite reliability	AVE
Business performance	0.881	0.914	0.68
Continuous improvement	0.732	0.833	0.555
Customer management	0.823	0.876	0.586
Customer satisfaction	0.891	0.917	0.649
EHLP	0.848	0.888	0.57
MHLP	0.858	0.891	0.54
Profitability	0.903	0.928	0.722
SLP	0.911	0.923	0.504
Sales	0.853	0.902	0.697

Table III: Fornell-Larcker criterion

	BP	CI	CM	CS	EHLP	MHLP	Profitability	SLP	Sales
BP	0.825								
CI	0.474	0.745							
CM	0.408	0.513	0.766						
CS	0.475	0.626	0.486	0.805					
EHLP	0.259	0.439	0.535	0.406	0.755				
MHLP	0.344	0.583	0.642	0.566	0.626	0.735			
Profitability	0.653	0.407	0.393	0.386	0.217	0.234	0.85		
SLP	0.389	0.608	0.611	0.575	0.638	0.607	0.317	0.710	
Sales	0.384	0.454	0.366	0.464	0.237	0.334	0.687	0.362	0.835

Table IV: Effect size and Stone-Geisser's values

	f^2			Q^2
	Business performance	Continuous improvement	Customer satisfaction	
Continuous improvement	0.356		0.421	0.194
Customer satisfaction	0.362			0.283
SLP	0.05	0.586	0.385	
Business performance				0.183

Table V: p values, t statistics and decision on hypotheses

Effect of	On	t statistics	p values	Decision on hypotheses
CI	BP	1.968	0.047	H5 is supported
CI	CS	3.927	0.000	H4 is supported
CS	BP	2.091	0.037	H6 is supported
SLP	BP	0.581	0.562	H2 not supported
SLP	CI	7.439	0.000	H3 is supported
SLP	CS	2.479	0.014	H1 is supported

Table VI: Indirect impacts

	t statistics	p values	Decision on indirect relationship
SLP -> CS-> BP	1.984	0.047	Supported
SLP -> CI -> CS -> BP	2.013	0.042	Supported
SLP -> CI -> BP	2.083	0.039	Supported

Table VII: Variance Account Factor values

	Direct effect	Indirect effect	Total effect	VAF
Effect of SLP on business performance with customer satisfaction as a mediator	0.077	0.154	0.231	0.667
Effect of SLP on business performance with continuous improvement as a mediator	0.077	0.229	0.306	0.748