EVALUATION OF CORRELATION BETWEEN TECHNOLOGY IMPLEMENTATION AND VARIOUS MATRICES OF SUPPLY CHAIN MANAGEMENT IN BRICK-AND-MORTAR MODEL BUSINESSES: A CASE STUDY IN SME BUSINESS IN KATHMANDU VALLEY

Deep Rajkarnikar[*1], Bhakta Bahadur Ale[*2]

[*1]Student, Department Of Mechanical And Aerospace Engineering, Institute Of Engineering (T.U), Lalitpur, Bagmati, Nepal.

[*2]Professor, Department Of Mechanical And Aerospace Engineering, Institute Of Engineering (T.U), Lalitpur, Bagmati, Nepal.

ABSTRACT

In context to Nepal, scope of technology in supply chain management is still in its nascent state, therefore very little study has been done. In regards to studying the impact of technology in supply chain management a survey was performed in SME businesses to find out the connection between independent and dependent variables for the aim of this research. The numbers of variables influencing the adoption of technology in supply chain management were based on a study of previous research work around the globe. Through various statistical techniques, the data gathered from the questionnaire was examined and interpreted; the findings obtained from hypothesis tests were presented by using various figures and figures. This research tests four hypotheses, which offer a scientific basis for using a particular strategy for competitive advantage between the introduction of new technologies for supply chains and variables influencing technology namely Cost reduction, business performance, responsive time and interactions with other parties.

Keywords: Technology, Supply Chain Management, Statistical Analysis, SME.

I.　INTRODUCTION

Small and Medium scale enterprises or SMEs as they are referred to are, as the name suggests, enterprises that are sized small or medium based on the capital deployed to the business and the operational infrastructure size. And 'Brick and Mortar' is an industry specific term which refers to the businesses offering products and services to the customers, traditionally in a face-to-face manner in offices or stores rented or owned by the firm. Today, businesses increasingly use modern technology management to enhance their business competitiveness and compete in the global market. The initiation of digital transformation for brick-and-mortar businesses is the use of technology in SCM. From the literature analysis, it seems that there are lacunas in research that enable companies to adapt and utilize technology for the supply chain successfully. The purpose of this study is to assess the depth and advantages of adoption of procurement technologies by examining different levels of activity and therefore finding the most important variables supporting the use of technology in SCM specifically in the brick-and-mortar model businesses in the SME section.

The main objective of this research is to evaluate the present state of technology implementation in supply chain management and determine the effect of technology on supply chain management across SME businesses in Kathmandu valley. This study seeks to detect the connection between implementation technology in SCM and its correlation in different variables in the SME businesses in Kathmandu. The study analyzes the state and operational systems and procedures of SCM technologies. It also highlights the issues causing an organization to determine whether to adopt/implement new technologies or to maintain them.

II.　LITERATURE REVIEW

Supply chain management (SCM), in general, is a widely researched subject due to its direct impact on the overall business operations. In the early 1990s, supply chains were still seen as linear businesses' networks (Kemppainen & Vepsalainen, 2003). However, nowadays the notion of the supply chain is regarded as a network rather than a chain. In this regard, Lumsden (1998) described the distinct flows constituent in supply chain management. Introduction of technology in SCM is a pivotal disruption that helps businesses to gain the

competitive advantage in the value chain, Levary (2000). Nepalese SMEs have difficulties in having a proper seamless management of all the different components of the supply chain ranging from data management to vendor relations and proper flow of information across channels in time. (Adhikari, Shakya, Devkota, Karki, 2021).

Technology undoubtedly is making its way into the supply chain management spectrum and with all the research that has been conducted showing a positive impact on Supply chain it evidently will gain much more pace in the days to come. Coercive pressures on supply chain members (Premkumar, Ramamurthy and Crum, 1997) or industry are an inter-institutional element that may facilitate inclusion of technology on supply chain management (Norris, 1988). But a collective voice on the fact that using efficient technology in SCM has had a positive impact on various variables of SCM can be heard over all individuals in the SCM field (IndianMBA.com).

III. RESEARCH METHODOLOGY

This research will examine the influence of technology on the supply chain and determine the probable effects of supply chain management variables. The study was done using the questionnaire technique to get answers from the individuals in the chain management industry/department, from various companies in Nepal. A typical research method is adopted for this research initiating with the identification of the field of study and reviewing past research conducted on the particular topic. The framework consists of a descriptive study to be conducted on a sample size to reflect the understanding of the sentiment of the entire population. Collected data are analyzed to see if the hypotheses that we had created are accepted or rejected, which in turn will provide us a review on the correlation between various factors of SCM and implementation of Technology.

Study Design: A Descriptive research approach with hypothesis testing is used in this thesis; survey is conducted by taking response from people working in the SCM department across SME businesses.

Sample Description: Total Sample of 383 respondents were taken working in supply chain management in SMEs.

Data Sources: Primary Data Source: Collected through questionnaire filled by the sample population

Study Pilot: A small pilot study was done over a selected group of 15 respondents to test the feasibility of study which prompted removal of some unnecessary questions.

Instrument of Data collection: Questionnaires were used for data collection; Likert scale forms were used for convenience and reliability.

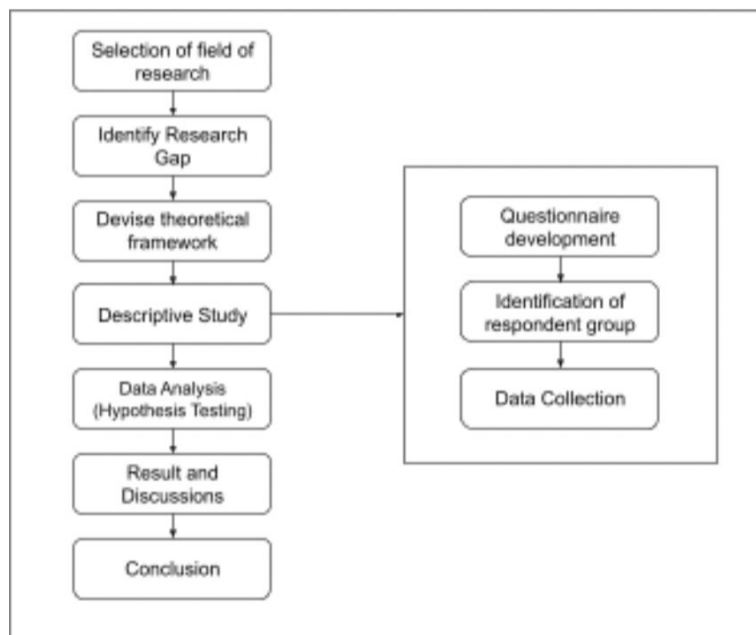**Data Analysis**: SPSS and MS Excel were used to analyze the collected Data.

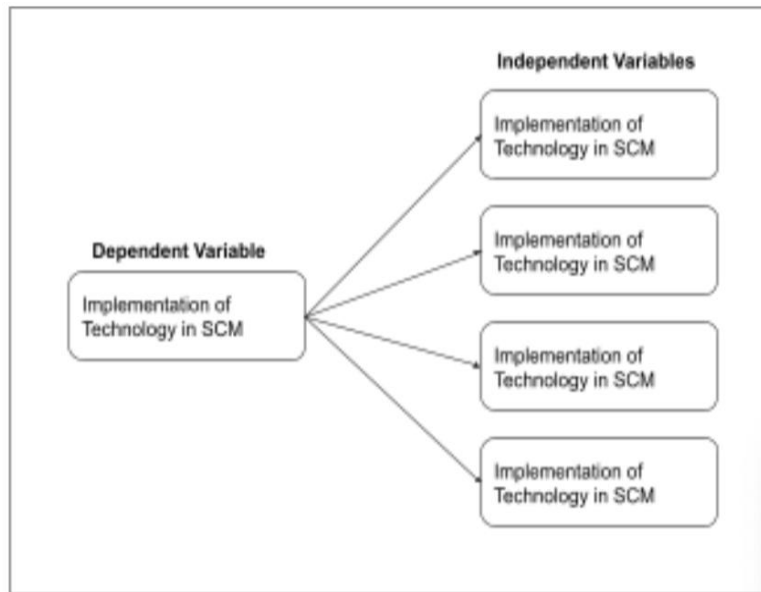**Figure 3.1:** Research Methodology Flow

Figure 3.2: Theoretical framework Representation

IV.   RESULTS AND DISCUSSION

On the basis of the survey answers, three main statistical analyses were conducted as profile, descriptive analysis and hypothesis tests. The respondents' profile provided the participants with essential information, like gender, age, organizational character and the controlling function of respondents. In order to understand the perspective of respondents about new technology in the supply chain, the mean value, standard deviation, and crosstabs will be examined in the descriptive analysis. Finally, tests on hypotheses are presented to fulfill the study goals and to address the research questions issue of this study.
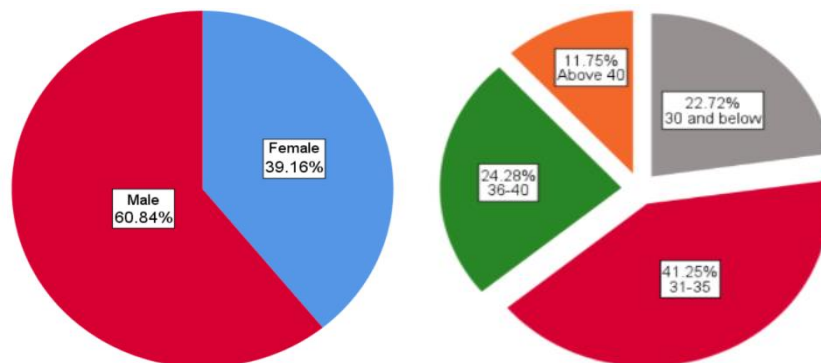
1.   Profile

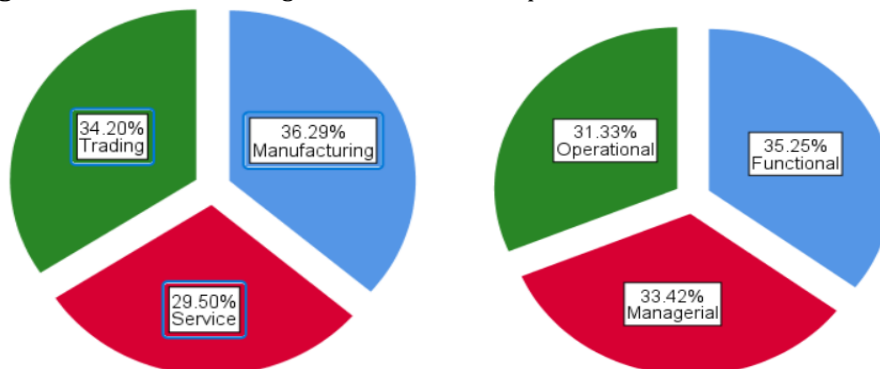**Figure 4.1 & 4.2**: Percentage Distribution of Respondents based on Gender and Age

Figure 4.3 & 4.4: Distribution of Respondents based on Nature of Organization and Position of respondents

2.   Descriptive Analysis

Descriptive analysis includes statistical measures computation. These values enable researchers to evaluate data on the frequency and aggregation of study topics and variables.

The respondents were given questions on the "Five-Point Scale Likert," with a size of 1 (strong agreement), 2 (agreement), 3 (neutral), 4 (disagreement), 5 (strongly disagree). In each question item, the number of responses was 383.

New technology adoption in logistics

Table 4.1: Adoption of New Technology in Supply Chain Management

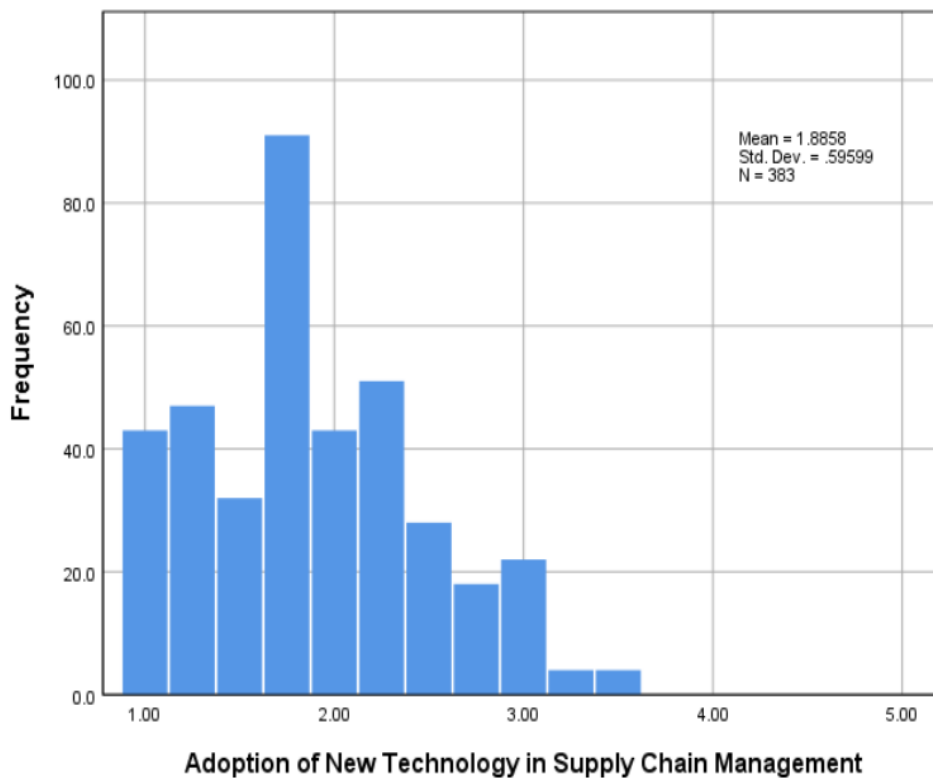| Statements	Mean	S.D	Minimum	Maximum
Adoption of new technology impacts the firm's operations	1.630	0.929	1	4
Adoption of new technology makes it easy for users	1.840	0.663	1	3
Adoption of new technology leads to improved delivery services	1.930	0.817	1	3
Adoption of new technology is a source of competitive advantage	2.150	0.866	1	4

Figure 4.5: New technology adoption in chain management

The histogram shown in Figure 4.5 shows that employee answers are skewed (many respondents are below average 2.20), and that significant percentages of respondents believe that organizations should embrace new technologies at SCM.

Firm Performance

Table 4.2: Impact of Technology on Firm Performance

Statements	Mean	S.D	Minimum	Maximum
Product and service on time	1.740	0.684	1	4
Average production costs reduction	1.860	0.754	1	4
Overall customer service level	1.970	0.821	1	4
Increased customer satisfaction	2.370	0.854	1	4
Improved cooperation between suppliers and consumers of logistical operations	2.370	0.784	1	4

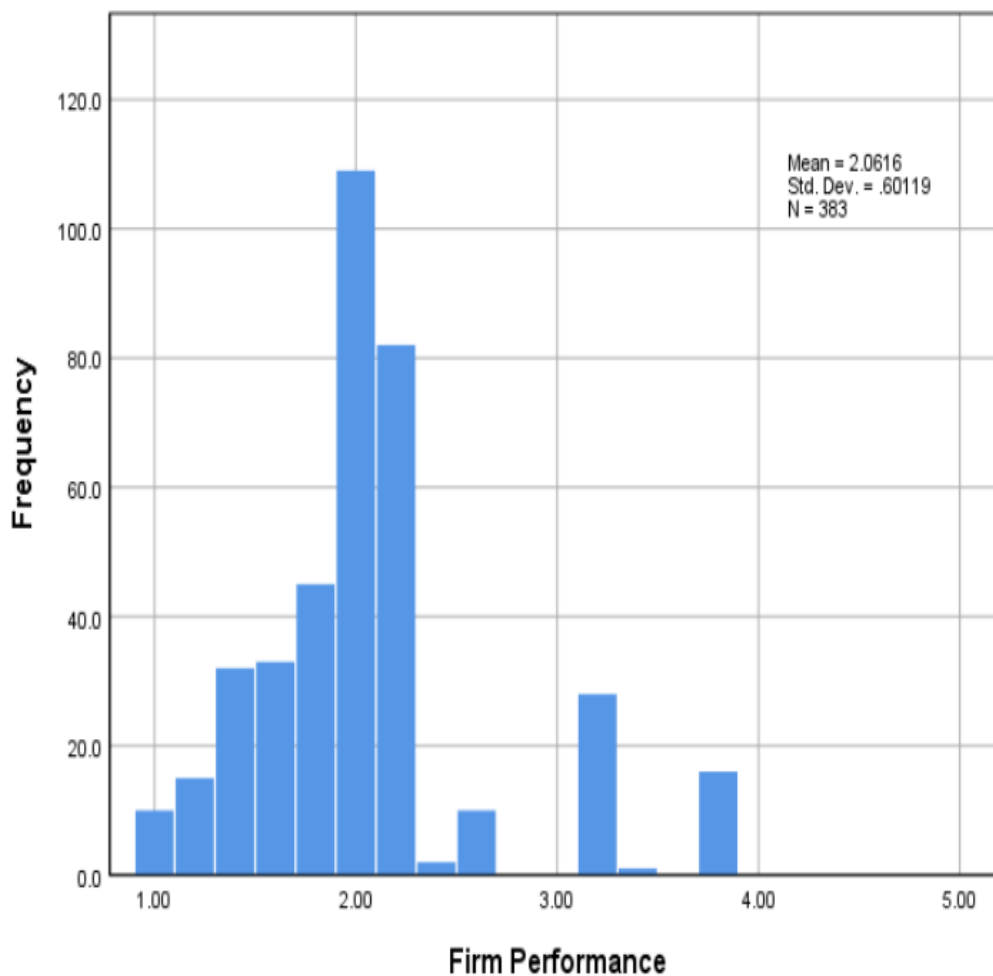Mean = 2.0616
Std. Dev. = .60119
N = 383

Figure 4.6: Impact of Technology on Firm Performance

The histogram in Figure 4.6 shows that employee answers are skewed (large numbers of participants fall below the mean average of 2.0616); significant numbers of respondents believe that the company's performance is enhanced with the adoption of new technologies via SCM. A larger percentage of respondents indicated more consensus on company success via the use of modern SCM technologies.

Cost Reductions

Table 4.3: Impact of Technology on Cost Reduction

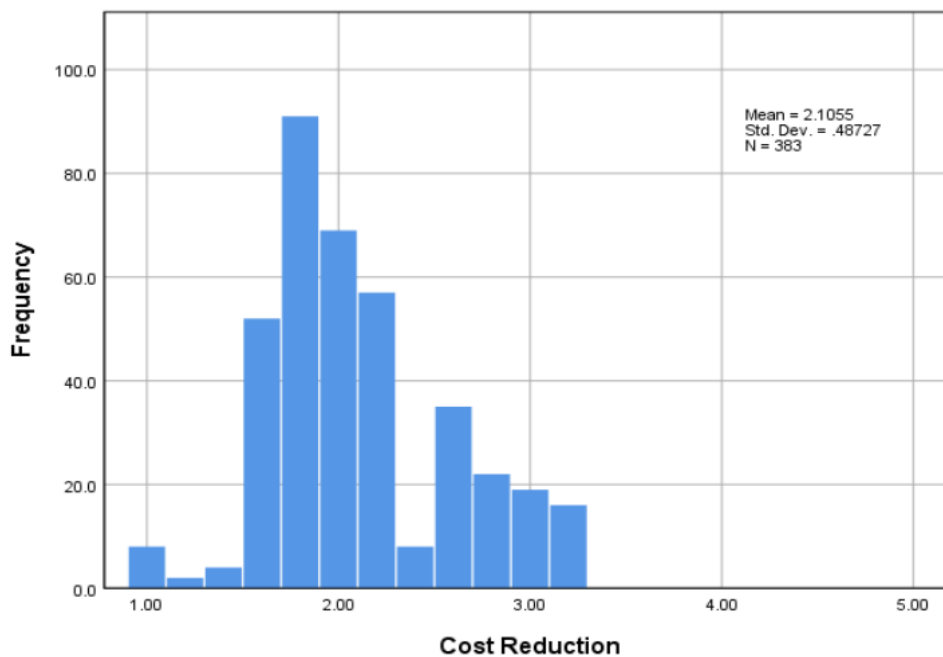| Statements	Mean	S.D.	Minimum	Maximum
Reduced labor on paper and human mistakes	1.980	0.521	1	3
Lowered the cost of ordering suppliers	2.030	0.789	1	4
Improved accuracy of shipping	2.130	0.570	1	3
Reduced customer order processing costs	2.140	0.599	1	3
Improved productivity	2.250	0.519	1	3

Figure 4.7: Impact of Technology on Cost Reduction

Histogram presented in Figure 4.7 showed responses from employees are left-skewed (large numbers of respondents fall below the average mean value of 2.1055), which revealed large numbers of respondents agreed that cost is reduced by adopting new technology in SCM. Larger numbers of respondents expressed higher levels of agreement regarding cost reduction by adopting new technology in SCM.

Relationship with other parties

Table 4.4: Impact of Technology on Relationship with Other Parties

Statements	Mean	S.D	Minimum	Maximum
The business and its suppliers and customers are committed to technology.	2.430	0.723	1	4
Technology helps to build trust between companies and their suppliers and consumers.	2.420	0.785	1	4

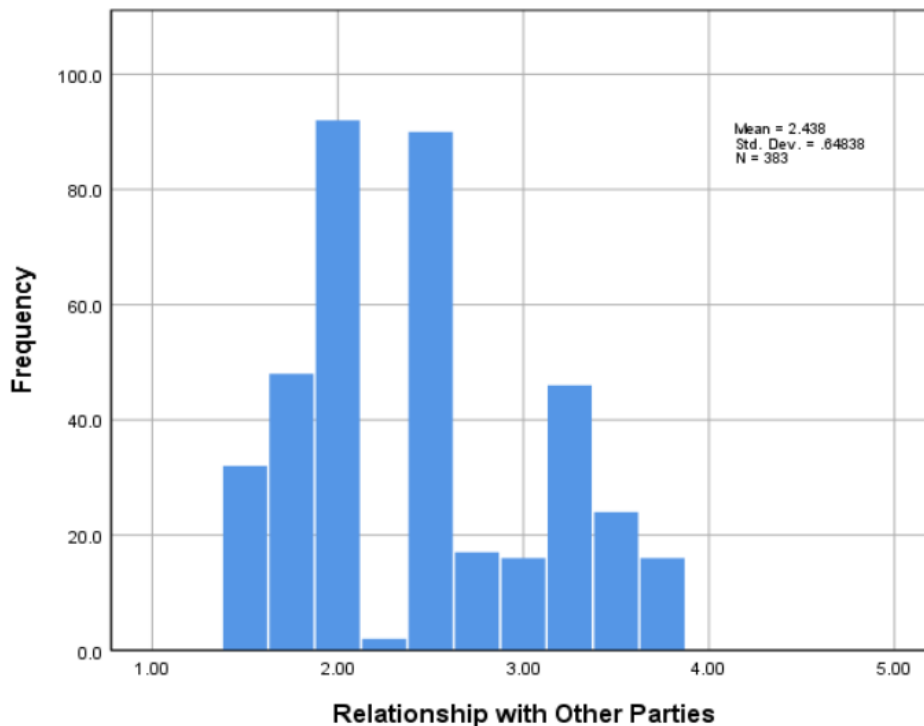|			
The business is usually pleased with the information sharing between the organization and its stakeholders and suppliers.	2.450	0.860	1	4
The implementation by customers and suppliers of the supply chain technology has pushed the business to adopt the technology.	2.450	0.661	1	4

Mean = 2.438
Std. Dev. = .64838
N = 383

Figure 4.8: Impact of Technology on Relationship with Other Parties

The histogram displayed in Figure 4.8 shows that the employee's answer was left skewed (a significant number of people responding fell below the average 2.438 average), with large numbers of respondents agreeing that connections with other parties were excellent via the use of new SCM technologies. Larger percentages of respondents indicated more agreement on excellent connections with third parties via SCM's use of new technologies.

Time for response

Table 4.5: Impact of Technology on Response Time

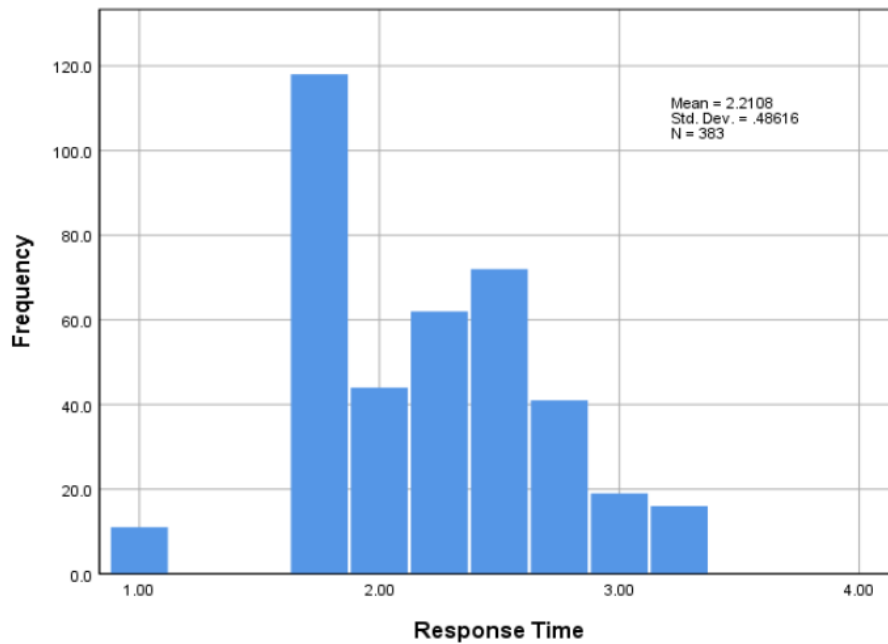| Statements	Mean	S.D.	Minimum	Maximum
Quick process to information	1.920	0.604	1	3
Frequent contact with the suppliers and customers	2.310	0.642	1	3
Reduced delivery time from order receipt	2.140	0.677	1	4
Improved exchange of information with suppliers and clients	2.490	0.555	1	3

Figure 4.9: Impact of Technology on Response Time

The histogram displayed in Figure 4.9 shows employee answers to the situation as skewed, with a significant number of interviewees falling below the average of 2.2108 and huge numbers of participants agreeing that reaction times are rapid by implementing modern SCM technology. A greater percentage of respondents agreed with the use of modern technology in SCM on rapid reaction time.

3.   Hypotheses Testing

This section analyzes potential connections between previously stated variables. To this end, the researchers evaluated hypotheses performing a study of the connection between both the implementation of new technologies and the variables influencing supply chain management. The issue of interest is reduced in each topic under consideration into two conflicting claims/hypotheses from which we have the option; the null hypothesis indicated by H0 versus the alternative hypothesis designated by H1. Multivariate regression Pearson Correlation is a technique for testing the connection between variables at an adequate meaning level. The section discusses four alternative hypotheses to solve the study problem of the implementation of new tools and protocols on the basis of the perspective of respondents from various industries and levels.

Null Hypothesis (H0): There's really no substantial connection between {variable} and new technology implementation in SCM.

Alternative hypothesis (H1): That the connection between {variable} and new technology implementation in SCM is substantial.

Table 4.6: Correlation between Adoption of New Technology and variables of SCM

Variables	Implementation of New Technology in SCM		
	Pearson Correlation	**Sig. (2-tailed)**	**N**
Firm's Performances	0.559**	0.000	383
Cost Reduction	0.650**	0.000	383
Relationship with other parties	0.579**	0.000	383
Response Time	0.733**	0.000	383
**. Correlation is significant at the 0.01 level (2-tailed).			

The Pearson Correlation coefficient is given for the four variables and as per the values all the variables show a positive correlation with implementation of technology. Out of the 4 variables Response Time showed the most positive correlation with a coefficient of 0.733 and Firm's overall performance showed the least with coefficient of 0.559. Also, the p-value for all the four variables is 0.000 which is less than the critical value of 0.001 which signifies that all the four null hypotheses can be rejected and hence there is a positive correlation between each of the variables with adoption of technology.

V.   DISCUSSIONS

The aim of this research was to study the impact of implementation of technology on various factors of SCM in various functions in Nepalese SME companies. In general, it has been shown that the introduction of new technology has a favorable connection with their variables such as cost reductions, company success, relationships with others and reaction times. Among these variables, responsive time has the greatest connection with the use of new technologies in an organization, meaning the organization has a rapid reaction time if it embraces new technology and similarly Cost reduction also has a very strong correlation. However, interactions with third parties and company's overall performance were less impacted than other variables technology introduction in SCM.

VI.   CONCLUSION

The research focused on understanding the effect of technology on chain management in the Nepal business by conducting a descriptive questionnaire with 383 respondents. The study focused on individuals who work in various industrial, trade and service companies. The men were 60.8 percent and the women were 39.2 percent. In terms of age category, the bulk of respondents were primarily between 31-35, which accounted for 41.3 percent of the total. The least responders in the age category were nevertheless over 40, i.e., 11.7 percentage points of the total number of respondents. In the respondents' positions, 33.9 percent were operational, 32.6 percent were functional and 33.4 percent managerial. The organization in which the respondents were working was mostly the manufacturing sector (36.3%) and the trading sector was 34.2% and service sector was 29.5%.

The study has found that there is indeed a positive link between new technology being used in SCM in Nepal institutions and factors influencing modern software in SCM in Nepal organizations, which means that the management of the supply chain positively influences the variables of supply chain that were selected in this survey.

The research evaluated four hypotheses and rejected all zero hypotheses providing scientific explanation between SCM and other factors for adopting new technology.

VII.   REFERENCES

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