[1.] Vishnu Kumar SINGH

INFORMATION DYNAMICS IN SUPPLY CHAIN MANAGEMENT

[1.] Department of Mechanical Engineering (Maintenance), IIMT College of Polytechnic, Uttar Pradesh, INDIA

Abstract: This article empirically examines the effects of environmental uncertainty, intraorganizational factors, and interorganizational relationships on information sharing and information quality in supply chain management. Using data collected from 196 organizations, multiple regression analysis is applied to examine factors that influence information sharing/quality. Information sharing and information quality were found to be positively influenced by trust in supply chain partners and shared vision of supply chain partners, but negatively influenced by supplier uncertainty. The results of study show that change and quality of information are not influenced by customer uncertainty, technological uncertainty, the involvement of supply chain partners or supporting IT facilities. Furthermore, discriminant analysis shows that supplier uncertainty, supply chain partner shared vision, and supply chain partner commitment are the three most important factors in distinguishing organizations with a high level of shared vision and information quality from organizations with a low level of information sharing and quality information.
Keywords: information sharing, information quality, supply chain management, supplier, customer

1. INTRODUCTION
Understanding and practicing supply chain management (SCM) has become essential to remain competitive in the global race and increase profits [12, 44, 51]. Information sharing is a key element of any SCM system [37]. Many researchers believe that the key to an efficient supply chain lies in the seamless and timely exchange of marketing data at every node in the supply chain [12,54].

The benefits of information exchange in SCM were discussed in detail [10]. Information sharing improves coordination between supply chain processes, enables material flow, and reduces inventory costs. Information sharing leads to a high level of supply chain integration [24]. A high-quality exchange of information has a positive effect on customer satisfaction [48] and the quality of the partnership [30]. Information exchange influences supply chain performance in terms of overall costs and service levels [63]. According to Lin et al.[33] greater information exchange leads to lower overall costs, higher order fulfilment rates and shorter order lead times.

Although information sharing is important, the extent of its impact on supply chain performance depends on what information is shared, when, how, and with whom [13,22]. The literature is replete with examples of the disruptive effects of inaccurate/delayed information along the supply chain [35]. Different interests and opportunistic behaviours of supply chain partners as well as information asymmetries throughout the supply chain impact information quality [17]. It is suspected that companies intentionally misrepresent information that could reach not only competitors but also their own suppliers and customers [35]. There appears to be an inherent reluctance of organizations to disclose more than a minimum amount of information [6]. Few studies have simultaneously examined the influence of environmental factors, intra-organizational factors, and interorganizational factors on information sharing and information quality factors.

To address this gap, this article first identifies a number of factors, including environmental uncertainties, intra-organizational factors and interorganizational. Supply chain, supply chain partner engagement and shared vision between supply chain partners that can influence information exchange and information quality in SCM. Using data collected from 196 organizations of varying sizes and industries, multiple regression analyzes are used to test the factors affecting information sharing and information quality in SCM, followed by discriminant analysis that examines the relative importance of each of the eight factors in high-level discrimination examined.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT
Figure 1 is a diagram showing the factors affecting information sharing and information quality in SCM, while Table 1 summarizes the influence of each factor on information sharing and information quality. Other factors such as company size, order volume, industry type and supply chain structure can influence the exchange and quality of information.

▓ Information sharing and information quality

Information sharing refers to the extent to which critical and proprietary information is shared with a supply chain partner [38]. Many researchers have highlighted the importance of information sharing in SCM practice. Lalonde [27] considers information sharing to be one of the five elements that characterize strong supply chain relationships. According to Stein and Sweat [49], supply chain partners who regularly share information can operate as a single unit. Together they can better understand the needs of the end customer and thus react more quickly to market developments. Furthermore, Yu et al.[62]

Figure. 1: A research framework of the factor impacting information sharing and information quality in SCM

emphasize that the negative impact of the bullwhip effect on the supply chain can be reduced or eliminated by sharing information with trading partners. Empirical findings from Childhouse and Towill [12] show that material flow optimization, including optimization and visibility of the entire information flow along the chain, is key to an integrated and effective supply chain.
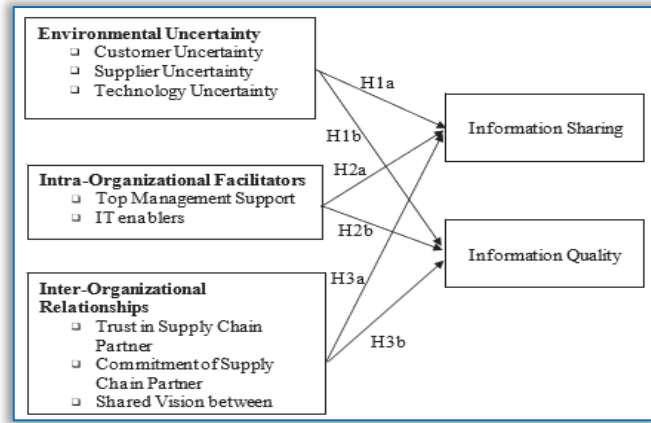
Table 1: Information sharing and information quality impacts

Independent variables		Dependent variables	
		Information sharing	Information quality
Environmental Uncertainty	Customer Uncertainty	• As customer demands become more unpredictable, a company must share more information with its supply chain partners to adapt to the changing needs of its customers [18,56].	• As customer demands become more unpredictable, organizations must share accurate information promptly [18,56].
	Supplier Uncertainty	• Unreliable suppliers have an effect on the entire supply chain, so in order to reduce supplier uncertainty, an organization will form partnerships with a select few suppliers to share information [41,62].	• Because of supplier uncertainty, it's important to exchange high-quality information to lessen supplier uncertainty and its effects on the entire supply chain [41,62].
	Technology Uncertainty	• Organizations must exchange information to stay up to date with the rapid changes in technology today [26].	• The advancement of IT makes it possible for businesses to exchange information efficiently and on time [13,55].
Intra-organization Facilitators	Top management support	• To overcome the resistance to sharing information and establish an organizational culture that supports it, top management is required [30].	• Senior management must recognize the value of disseminating accurate information and ensure that it does so without delay or distortion [17].
	IT enablers	• Organizations can share more information due to IT [13, 24, 48] Through information sharing, IT helps organizations to create new opportunities for growth [9].	• Organizations can exchange data concurrently throughout the supply chain thanks to IT [13, 24, 48]. IT facilitates safe information exchange [32].
Inter organizational relationships	Trust in supply chain partners	• One frequently mentioned barrier to information sharing has been identified as a lack of trust [39, 47].	• Positive attitudes and actions are encouraged by trust, ensuring accuracy of information shared [45].
	Commitment of supply chain partners	• It has been determined that commitment is the factor that distinguishes between relationships that last and those that end [59].	• By raising the stakes, commitment makes it more difficult for partners to take actions that could degrade the quality of information shared.
	Shared vision between supply chain partners	• Information sharing amongst supply chain partners will decrease if there isn't a common vision [7,36].	• When there isn't a common goal between the parties (due to cultural or other differences), there will be more resistance and negative behaviors will be encouraged, which will lower the quality of information sharing.

Information quality concerns aspects such as accuracy, timeliness, appropriateness and reliability of the information exchanged [38]. Although information sharing is important, the extent of its impact on SCM depends on what information is shared, when, how, and with whom [13]. Jarrell [24] points out that sharing information across the supply chain can provide flexibility, but requires accurate and timely information. Information is known to suffer from delays and distortions as it travels through the supply chain [17,35]. Additionally, due to traditional culture, companies may intentionally misrepresent purchasing information to hide their intentions from competitors as well as their own suppliers and customers [35].

▓ Environmental uncertainty

Environmental uncertainty is an important external force driving information exchange in SCM. Customers demand more variety, better quality, greater reliability and faster delivery [53]; the product life cycle is shortened and product proliferation increases; Technological development is progressing

ever faster. To respond to such an uncertain environment, companies have increased the level of outsourcing and collaboration with their customers and suppliers. [26].

Environmental uncertainty can be classified based on the source of the uncertainty. For example, Gupta and Wilemon [19] consider perceived environmental uncertainty arising from the following four factors:

1) increasing global competition,

2) the continuous development of new technologies that quickly make existing products obsolete,

3) evolving needs and customer requirements, which shorten the product life cycle and

4) the growing need to involve external organizations such as suppliers and customers.

The following section addresses each of these three uncertainties.

— *Customer uncertainty* is defined as the degree of change and unpredictability of customer needs and preferences. Customer demand for products and services is becoming increasingly variable and uncertain in terms of quantity, range, time and location. Today's customers want more choice, better service, better quality and faster delivery [9,56]. In addition, competitive pressures in the global market have significantly changed the traditional way customers make decisions.

— *Supplier uncertainty* is defined as the extent of change and unpredictability in the supplier's product quality and delivery performance. There are many causes of supplier uncertainty: the supplier's technical level, the supplier's delivery times, the supplier's delivery reliability, the quality of incoming materials, etc. [29]. Furthermore, this uncertainty will impact the entire supply chain in the form of increased order variability, resulting in excess safety stock, higher logistics costs and inefficient use of resources [62]. A manufacturer whose key suppliers have a track record of poor quality and delivery will have significant difficulty in providing a high level of customer service, even in a stable environment [41].

— *Technological uncertainty* refers to the extent of change and unpredictability of technological development in an organization's industry. For example, IT innovations have driven the trend of supply chain and business process integration [13]. Advanced IT systems reduce the transaction costs associated with controlling the flow of goods and enable rapid response to customer orders. For example, IT development will improve the competitive basis through easy access to global supplier organizations [16].

Intra-organizational facilitators

Executive support is defined as the degree to which senior management understands the specific benefits and support of sharing high-quality information with supply chain partners. Many researchers [5,20] have identified top management support as the most important factor for any successful change in an organization. To implement information sharing in supply chains, senior management must understand and consider the significant operational and commercial implications of the partnership, as well as develop a good understanding of their potential partners and senior management [36].

Without state-of-the-art IT systems, companies cannot effectively manage costs, provide superior customer service, and advance SCM [55]. The transaction cost perspective can be used to explain the influence of IT in creating interorganizational information exchange and coordination [14]. Transaction costs include the costs of preparing, monitoring and executing contracts as well as the costs of searching for potential trading partners. The extensive use of core information technologies such as electronic data interchange (EDI), Internet and extranets has helped many organizations achieve operational excellence and competitive advantage [25].

The impact of top management support on information sharing and information quality

Management must have a common understanding of the specific benefits of information sharing in order to overcome the inevitable differences of interests between participating organizations [30]. In order to integrate the information exchange strategy in SCM into the overall business strategy of the organization, it is very important to support top management and obtain required resources for the implementation of information exchange [9,60]. To overcome the reluctance to share information, senior management must understand the advantages and create an organizational culture that promotes information sharing and ensures that information is shared without delay or manipulation. The above arguments lead to:

— *Hypothesis 2.a1.* The higher the support from top management, the higher the information exchange in the SCM.
— *Hypothesis 2.b1.* The higher the support from top management, the higher the quality of information in the SCM.

The impact of IT enablers on information sharing and information quality

Many researchers consider IT to be an excellent means of information exchange and information quality in SCM [13,23,48]. It enables coordination across organizational boundaries to achieve new levels of efficiency and productivity [34] and opens up new opportunities for added value through improved communication and information sharing [9]. The introduction of various IT solutions will facilitate information exchange and quality in SCM. For example, the use of EDI can support the secure exchange of information between trading partners [32] and contribute to partnership satisfaction, success and longevity [57].

The Internet expands the scope of SCM practice by providing a cost-effective communication framework so that information can be exchanged efficiently and effectively between supply chain partners [58], while an intranet can be used to support and promote more effective exchange of internal information [58]. At the same time, information and process changes can be communicated to business partners more quickly and precisely via the extranet [43]. It is understood that:

— *Hypothesis 2.a2.* The greater use of IT solutions, the higher exchange of information in SCM.
— *Hypothesis 2.b2.* The greater use of IT solutions, the higher quality of information in SCM.

Inter-organizational relationships

The interorganizational relationship refers to the level of trust, commitment and shared vision between supplier partners. Without a foundation of effective interorganizational relationships, any effort to control the flow of information or materials in the supply chain is likely to fail [21]. Trust and commitment are necessary to build long-term collaborative relationships between supply chain partners [48,50]. Acrol et al.[1] identify commitment, trust, group cohesion and motivation of alliance participants as crucial for interorganizational strategic alliances. In this study, the interorganizational relationship considers three subdimensions: trust in business partners, commitment of business partners, and shared vision of business partners.

Trust in business partners is defined as the willingness to rely on a business partner that one trusts [38,48]. Trust is expressed by confidence, trust in a supply chain partner, understood as the willingness to refrain from opportunistic behavior (48).Many researchers consider trust to be an important factor in the most productive partnerships [59]. Parties who trust each other can find ways to resolve difficulties such as power, conflict, and reduced profitability. Trust stimulates positive attitudes and behaviors [45]. Additionally, the ability for an external organization to view transaction-level data increases trust between trading partners due to the competitive risks associated with this type of access [61].

A business partner's commitment refers to the willingness of buyers and suppliers to commit to the relationship [38,48]. The shared vision of business partners is defined as the degree of similarity of shared values and beliefs between business partners [1,30]. A shared vision is therefore the extent to which partners share common beliefs about what behaviors, goals and principles are important and unimportant, appropriate or inappropriate, good or bad [4]. It is obvious that supply chain members with similar organizational cultures should be more inclined to trust their partners. Spekman et al.

The impact of inter-organizational relationships on information sharing and information quality

Without good interorganizational relationships based on intangibles such as trust, commitment, and a shared vision, organizations will be reluctant to share information with supply chain partners for fear of information disclosure and loss of power to a competitor. The lack of trust between suppliers and manufacturers prevents them from building collaborative relationships [46]. Boddy et al. [7] empirically examined supplier-customer partnerships using an interaction model and found that the lack of a shared vision (e.g. cultural and other differences between the parties) initially leads to difficulties in collaboration. The above arguments lead to:

— *Hypothesis 3a.* The higher the level of interorganizational relationships (including trust in business partners, commitment of supply chain partners, and shared vision among supply chain partners), the higher the level of information sharing in SCM.

— *Hypothesis 3b.* The higher the level of interorganizational relationships (including trust in business partners, commitment of supply chain partners, and shared vision among supply chain partners), the higher the level of information quality in SCM.

3. RESEARCH METHODOLOGY – LARGE-SCALE METHODS

This section describes the research methodology used to test the hypothetical framework presented in the figure. 1. A field survey collected empirical data to test the research framework. This study measured six elements: information sharing, information quality, environmental uncertainty, top management support, IT facilitators, and interorganizational relationships. All concepts were designed in four phases: (1) Generation of article, (2) pre-pilot study, (3) pilot study, and (4) data analysis at large scale. The elements for each concept were created based on an extensive literature review.

In the pilot research phase, the three-round Q-sorting method was initially used to assess the convergent and discriminant validity of the scales. To assess the reliability of judge ordering, three different measures were used: raw interjudge agreement scores, Cohen's kappa, and item placement coefficients. In the third round, raw interjury agreement scores averaged ± 0.92, and the overall initial item ranking coefficient for the target concepts was 0.97, and Cohen's kappa value averaged 0.90. At this point, the statistics show an excellent level of agreement between judges, indicating a high level of reliability and construct validity.

Mailing lists were obtained from two sources: the Society of Manufacturing Engineers (SME) and participants at the Council of Logistics Management (CLM) conference held in New Orleans in 2000. Six SIC codes were included in the study: 25 "Furniture and Equipment." ", 30 "Artificial rubber and plastic", 34 "Processed metal products", 35 "Industrial and commercial machinery", 36 "Electronic and other electrical equipment", 37 "Transportation equipment". The questionnaire's last version with items measuring all items on a five-point scale was distributed to 3,137 target respondents. 196 complete and usable responses were received, corresponding to a response rate of approximately 6.3%.

A significant problem with organizational-level research is that senior managers and executives receive many requests to participate in research and have very little time. This further contributes to the low response rate. Of the respondents, almost 20% were CEO/President/VP/Director. The respondents comprised of managers, some of whom identified themselves in the questionnaire as supply chain managers, plant managers, logistics managers or IT managers. Specialties included 30% purchasing, 47% manufacturing and 30% distribution/transportation/sales.

A comparison was then made between those who responded after the first mailing and those who responded in the second/third wave [2,38]. No significant differences was found between the two groups in terms of respondents' occupation, sales volume and location. We therefore conclude that there is no nonresponse bias.

Based on 196 responses, all constructs were tested for the following purposes: purity, unidimensionality, reliability, convergent and discriminant validity. The final list of items for each construct can be found in Appendix A. All constructs, except the IT tools, were rated using a five-point, fully anchored, multi-item Liker scale ranging from strongly disagree to agree "completely too" was enough. The items for IT professionals were rated on 5-point Liker scale ranging from "Not at all" to "To a great extent." With the exception of customer uncertainty, at least three elements were included for each individual project to ensure adequate reliability, as recommended by Nunnally [40].

The correlation matrix of the independent variables is shown in Table 2. It can be seen that there are strong correlations between each sub-construct of environmental uncertainty and interorganizational relationships, indicating good convergent validity of these two constructs. From all comparisons we conclude that the scale has discriminant validity. Examination of the correlation matrix to assess discriminant validity shows a total of 3 violations in 44 comparisons. No number for any item exceeds half of the potential comparisons. They therefore have good discriminant validity.

Table 2: Correlation matrix for independent variables

	CU	SU	TU	TMS	IT	TRU	COM	SV
CU	1.00							
SU	0.22**	1.00						
TU	0.19**	0.16*	1.00					
TMS	-0.05	-0.11	0.04	1.00				
IT	-0.15*	-0.17*	0.22*	0.07	1.00			
TRU	-0.08	-0.16	0.14	0.27**	0.11	1.00		
COM	-0.08	-0.22*	0.08	0.22*	0.15*	0.55**	1.00	
SV	-0.12	-0.09	0.10	0.38**	0.07	0.53**	0.57**	1.00
# of violation	0	2	1	0	0	0	0	0

CU: customer uncertainty, SU: supplier uncertainty, TU: technology uncertainty, TMS: top management support, IT: IT enablers, TRU: trust in supply chain partner, COM: commitment of supply chain partner, SV: shared vision between supply chain partner. **Item is significant at 0.01 level. *Item is significant at 0.05 level.

4. DATA ANALYSIS AND DISCUSSION OF RESULTS

The elements influencing information sharing and quality, as well as information sharing itself, are first explored in terms of means. Subsequently, regression analyses were employed to determine the factors that significantly affect information sharing and quality. A discriminant analysis was then conducted to assess the significance of each factor in differentiating between organizations that exhibit high levels of information sharing and quality and those that do not.

▦ The means of information sharing, information quality and the influencing factors of information sharing and information quality

A composite score is used to represent each factor by taking the average score of all items for that dimension. The mean and standard deviation of each factor is shown in Table 3. We see that information sharing and information quality in organizations are 3.31 and 3.33, respectively (on a scale of 1 to 5).

Regarding environmental safety, uncertainty about customers and technology in the surveyed organizations is high and is 3.60 and 3.59, respectively. The average score is 2.87. When it comes to intra-organizational factors, support for SCM from management is high in the organizations surveyed (3.66), while the level of IT enablers is low at an average of 2.47, indicating that organizations have

Table 3: Descriptive statistics for influencing factors, information sharing and information quality

SCM practice	Mean	Std. deviation
Information sharing	3.31	0.71
Information quality	3.33	0.63
Customer uncertainty	3.60	0.95
Supplier uncertainty	2.87	0.81
Technology uncertainty	3.59	0.84
Top management support	3.66	0.86
IT enablers	2.47	0.99
Trust in supply chain partners	3.65	0.63
Commitment of supply chain partners	3.75	0.57
Shared vision between supply chain partners	3.60	0.66

not used IT extensively to exchange information and ensure information quality. In interorganizational relationships, organizations rate the commitment of supply chain partners higher (3.75) than trust in supply chain partners (3.65) and shared vision of business partners (3.60).

Out of all the structures, the IT enablers represent five different e-business infrastructure solutions and have the lowest mean. Each IT

Table 4: Descriptive statistics for each IT enabler

IT enablers	Mean	Std. deviation
EDI	2.86	1.38
EFT	1.94	1.19
Internet	3.24	1.17
Intranet	3.18	1.49
Extranet	1.88	1.18

enabler's mean and standard deviation are displayed in a different table (Table 4). Internet, intranet, and EDI are the top three IT enablers utilized by enterprises, with means of 3.24, 3.18, and 2.86, respectively. In contrast, extranet and EFT usage attract lower attention inside the firm, as seen by their low means of 1.94 and 1.88, respectively.

▦ Regression analysis of the factors impacting information sharing and information quality in SCM

Two linear regression analyses are carried out, with information sharing and information quality as the dependent variables and the eight influencing factors as independent variables. Table 5 presents the findings. It is evident that supplier uncertainty has a negative impact on the degree of information sharing and information quality, while partner trust and a common vision are positive factors. On the one hand, the findings point to the significance of relationships between organizations in terms of information sharing and information quality. Conversely, the findings show that high levels of information sharing and high-quality information are correlated with low levels of supplier uncertainty.

Table 5: Regression analysis if information sharing and information quality in SCM

Independent variables	Dependant variables			
	IS		IQ	
	Standardized	Sig. coefficients	Standardized	Sig. coefficients
Customer uncertainty	0.027	0.670	-0.070	0.253
Supplier uncertainty	-0.187	0.004	-0.142	0.023
Technology uncertainty	0.082	0.205	-0.072	0.249
Top management support	0.140	0.031	0.105	0.094
IT enablers	0.091	0.153	-0.064	0.300
Trust in supply chain partners	0.204	0.008	0.240	0.001
Commitment of supply chain partners	0.116	0.142	0.126	0.100
Shared vision between supply chain partners	0.178	0.026	0.254	0.001
R	0.58		0.153	
R^2	0.34		0.38	
F-statistics	12.05		14.43	
Significance	0.00		0.00	

The findings also demonstrate that while top management support has a positive effect on information sharing, it has no discernible effect on the caliber of the information. In order to implement SCM effectively, top management must recognize the value of information sharing and provide the necessary resources, direction, and vision.

Discriminant analysis of organizations with high and low levels of information sharing

Discriminant analysis is used to divide organizations into two groups: the high information sharing group and the low information sharing group based on a weighted liner combination of all the influencing factors. First, the total number of information sharing items is divided by the total number of items to determine the mean of information sharing. On the basis of high and low values for information sharing in comparison to the sample mean for information sharing, the sample was then divided into the high and low information sharing groups.

The discriminant analysis results are shown in Table 6. The table gives details on the following:
(1) the size of the group;
(2) the standardized discriminant function coefficients and their significance; and
(3) the discriminant function's significance level.

Table 6: Discriminant analysis of organization with a high and low level of information sharing

Variables	Standardized coefficient	F value	Significance
Customer uncertainty	0.081	1.163	0.282
Supplier uncertainty	-0.519	19.294	0.000
Technology uncertainty	0.045	0.579	0.448
Top management support	0.102	7.804	0.006
IT enablers	0.242	6.659	0.011
Trust in supply chain partners	0.130	19.613	0.000
Commitment of supply chain partners	0.324	29.077	0.000
Shared vision between supply chain partners	0.430	26.811	0.000
Discriminant function statistics	Group 1 = Organization with low levels of information sharing (75 cases) Group 2 = Organization with high levels of information sharing (121 cases) Wilks' Lambda: 0.767, Chi-square: 50.418, significance: 0.000		

With a chi-square value of 50.418 (8 degrees of freedom), the discriminant function created in this study is significant at the p b 0.000 level. This offers compelling evidence in favor of the discriminate function's capacity to distinguish group membership based on the variables that are employed.

The larger the standardized coefficient's contribution to the function, the higher its absolute value. Accordingly, supplier uncertainty stands out as the variable that contributes most to the discriminant function, with supply chain partners' shared vision, commitment, and IT enablers coming in that order. Less significant factors include top management support and faith in trading partners. Organizations that share more information are clearly associated with lower levels of environmental uncertainty (related to suppliers, customers, and technology). The classification accuracy of the discriminant function was evaluated in order to further verify the model's informativeness. The descriptive model's classification results show a "hit rate" of 73.0%. This indicates that the discriminate model accurately classified about 73.0% of the organizations. The aforementioned outcome implies that the factors that were found to be significant in this study can effectively differentiate between organizations with high and low information sharing.

▦ Discriminant analysis of organizations with high and low levels of information quality

Similar discriminant analysis is once more employed to investigate the elements that influence information quality in supply chain management. The discriminant analysis results are shown in Table 7. With 8 degrees of freedom and a chi-square value of 67.036, the discriminant function is significant at the p b 0.000 level. The findings also demonstrate that, at the 0.05 level, every factor is significant, with the exception of two (technology uncertainty and IT enablers).

Table 7 also demonstrates that the most significant variable in terms of its contribution to the discriminant function is shared vision between trading partners. Table 8 demonstrates that companies with better information quality also have lower levels of environmental uncertainty (related to suppliers, customers, and technology), stronger interorganizational relationships (shown by shared vision, trust, and commitment), and higher levels of IT usage and top management support.

Table 7: Discriminant analysis of organization with a high and low level of information quality

Variables	Standardized coefficient	F value	Significance
Customer uncertainty	-.0.095	4.359	0.038
Supplier uncertainty	-0.0421	18.551	0.000
Technology uncertainty	-0.203	1.571	0.212
Top management support	0.030	7.647	0.006
IT enablers	-0.176	0.002	0.968
Trust in supply chain partners	0.292	31.800	0.000
Commitment of supply chain partners	0.334	39.486	0.000
Shared vision between supply chain partners	0.463	40.866	0.000

Table 8: Discriminant analysis of organization with a high and low level of information quality

Group means	Low information quality group	High information quality group	Overall
Customer uncertainty	3.76	3.47	3.60
Supplier uncertainty	3.13	2.65	2.87
Technology uncertainty	3.67	3.52	3.59
Top management support	3.47	3.81	3.66
IT enablers	2.47	2.47	2.47
Trust in supply chain partners	3.39	3.86	3.65
Commitment of supply chain partners	3.49	3.96	3.75
Shared vision between supply chain partners	3.29	3.84	3.60

The discriminate model's classification accuracy of 74.5% indicates that the influencing factors are capable of effectively differentiating between organizations with high and low information quality levels. The discriminant analysis shows that factors such as top management support, trading partner commitment, and customer uncertainty are important in differentiating between organizations with high and low information quality.

The study disregards any potential relationships between dependent variables in favor of concentrating on the effects of independent variables (environmental uncertainty, interorganizational facilitators, and interorganizational relationships) on dependent variables (information sharing and information quality). A more thorough investigation revealed a 0.48 Pearson correlation that is significant at the 0.0l level between IS and IQ. An organization may be encouraged to increase the amount of information sharing with its supply chain partners if it has a high level of information quality.

5. CONCLUSION AND FUTURE RESEARCH

This paper aimed to evaluate the sources of information sharing and information quality in supply chain management. In order to achieve that, a research framework was proposed by combining several theories from various referent disciplines, and six hypotheses were put forth (Fig. 1). It is discovered that supplier uncertainty has a negative influence on information sharing and that top management support, supply chain partner trust, and a shared vision all have positive effects. The findings also support Hypotheses 1b and 3b in part by demonstrating the influence of supplier uncertainty, supply chain partner trust, and shared vision on information quality. Since there is no discernible correlation between intra-organizational facilitators and information quality, hypotheses 2.b1 and 2.b2 are rejected. Furthermore, a discriminant analysis shows that the most significant variables in differentiating between organizations with high and low levels of information sharing and quality are supplier uncertainty, supply chain partners' commitment, and shared vision.

It should be noted that contextual factors, which are disregarded in this study, such as the kind of industry, firm size, a firm's position in the supply chain, supply chain length, and supply chain type, may have an impact on information sharing and information quality. Information is subject to delay and distortion during its journey through the supply chain, so the shorter the chain, the less likely it is that the information will be distorted.

According to this study, a partner's relationship is crucial for putting SCM practices into practice and raising SCM performance. Building strong partner relationships involves a number of factors, including shared vision, trust, and commitment. How, for instance, does one build mutual trust between trading partners? What abilities are required to establish credibility and commitment in a trading partner relationship? How can a company find channel partners who engage in actions that foster trust? What part does channel conflict play in a partnership? Future research should address them. Furthermore, the study's data came from individual respondents within an organization, which raises the possibility of response bias. This restriction must be considered when interpreting the results.

Appendix A: Items for environmental uncertainty, intra-organizational facilitators, inter- organizational relationships*

*Every item for every construct, with the exception of IT enablers, is rated on a Likert scale of 1 to 5, with 5 representing "Strongly Disagree" to "Strongly Agree." IT enabler items are scored using a Likert scale ranging from 1 to 5, with 5 representing "Not at all" to "To a great extent."

Information sharing and information quality
- Information sharing ($\alpha = 0.72$)
- We notify trading partners ahead of time of any changes in demands.
- We exchange proprietary information with our trading partners.
- We exchange business information about business procedures with our trading partners.
- Information quality ($\alpha = 0.86$)
- Our trading partners and we promptly exchange information.
- We exchange correct information with our trading partners.
- Our trading partners and we have finished exchanging information.
- We and our trading partners exchange enough information.
- Our trading partners and we have a trustworthy information exchange

Environmental uncertainty
- Customer uncertainty ($\alpha = 0.79$)
- Throughout the year, customers order various combinations of products.
- Over the year, customers' tastes for products vary.
- Supplier uncertainty ($\alpha = 0.81$)
- Within same batch, the qualities of materials from different sources can differ.
- The engineering proficiency of suppliers varies. Product quality from suppliers is erratic. Delivery schedules from suppliers might easily go awry.
- Technology uncertainty ($\alpha = 0.82$)
- Advancements in technology offer prospects for augmenting competitive edge.
- Innovation in technology leads to a plethora of new product concepts in our sector.
- In our sector, new products are regularly produced as a result of evolving technology.

Top management support and IT enablers
- Top management support ($\alpha = 0.90$)
- The relationship between us and our trading partners is significant to top management. Top management provides SCM with the necessary resources.
- SCM is viewed as a high priority item by top management.
- IT enablers ($\alpha = 0.74$)
- The degree to which your company uses EDI.
- How much EFT is used in your company.
- The degree to which your company uses the Internet.
- The degree to which your company uses its intranet.
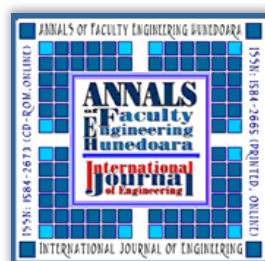- How much of an impact Extranet has on your company.

Inter-organizational relationships
- Trust in trading partners ($\alpha = 0.80$)
- Our trading partners have interacted with us in an honest and transparent manner.
- The privacy of the information our trading partners receive from us is respected.
- Our dealings with trading partners don't require constant oversight.
- Commitment of trading partners ($\alpha = 0.78$)
- In the past, our trading partners have given up things for us. We have worked very hard to build relationships with our trading partners. Our trading partners have excellent contract compliance.
- Shared vision between trading partners ($\alpha = 0.85$)
- Our trading partners and we share a common understanding of the goals and purposes.
- We recognize the value of enhancements that benefit the supply chain overall, and so do our trading partners.

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