

Haque, Md. Ziaul; Islam, Md Shariful; Deb, Santus Kumar; Islam, Md. Rashidul

## Article

# Strategic value of Online Social Networks (OSNs) in supply chain networks during COVID-19

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\*Corresponding author: Md. Ziaul Haque, Department of Management Information Systems, Noakhali Science and Technology University, Noakhali, Bangladesh  
E-mail [zia10093@yahoo.com](mailto:zia10093@yahoo.com)

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Len Tiu Wright, De Montfort University Faculty of Business and Law, UK

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## OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

# Strategic value of Online Social Networks (OSNs) in supply chain networks during COVID-19

Md. Ziaul Haque<sup>1\*</sup>, Md Shariful Islam<sup>2</sup>, Santus Kumar Deb<sup>3</sup> and Md. Rashidul Islam<sup>4</sup>

**Abstract:** The coronavirus (COVID-19) epidemic has transmuted the business environment and disordered supply chains worldwide. Over the last decade, online social networks (OSNs) have impacted every element of human life and corporate organization. Deploying OSNs services in supply chain networks is currently a pressing need. This study developed a model based on the IS success model, resource-based view, and absorptive capacity to explore the strategic value of OSNs in the supply chain network during COVID-19. Structural Equation Modeling (SEM) analyzes 220 data collected using online questionnaires. Information, system, and service quality emerged as influential features of online social networks that enhance the absorptive capacity and supply chain visibility and agility. The performance of the supply chain is positively impacted by each of OSN's strategic values, including visibility, agility, and absorptive capacity during COVID-19. In addition, absorptive capacity and supply chain visibility and agility mediate the association of information, system, and service quality features with supply chain performance. Supply chain managers and policy-makers will better grasp OSNs adoption necessities and features during pandemic situations. It will also contribute to operation management, information systems, and social media by presenting OSNs in a supply chain environment.

**Subjects:** Internet & Multimedia - Computing & IT; Management of IT; Databases; Information & Communication Technology; ICT; Industrial Engineering & Manufacturing; Technology; Business, Management and Accounting; Industry & Industrial Studies; Information Technology; Media & Film Studies

**Keywords:** COVID-19; supply chain performance; OSNs; strategic value; supply chain network

## 1. Introduction

The COVID-19 outbreak demonstrates how pandemics and epidemics may disrupt global supply chains (Queiroz et al., 2020). Several organizations realized the significance of responding quickly, adapting, and implementing crisis management procedures during the COVID-19 epidemic (Hedwall, 2020). During the worldwide epidemic in 2020, supply chain management (SCM) struggled to meet unexpected demand for particular items while simultaneously restricting travel and manufacturing (Mazareanu, (2020)Coronavirus). These interruptions negatively impact sales, profits, stock returns, brand image, job security, buyer safety, and overall supply chain performance (Veselovská, 2020). It is necessary to understand the supply chain resilience mechanism in order to respond to COVID-19 disruption (Robb et al., 2022). As a result, maintaining supply networks has become difficult as specific supply chain components have ceased operations (Ivanov, 2020). COVID-19 affects practically all manufacturing enterprises across sectors (Linton

& Vakil, 2020); however, the consequences vary according to the goods, e.g., high-demand items or low-demand ones.

Moreover, although demand for these items increases rapidly, raw material availability decreases dramatically during the pandemic (Ivanov, 2020; Linton & Vakil, 2020). As a result, the unprecedented outbreaks have impacted society and operations and supply chain management (OSCM) business models (Lin et al., 2020). The digitization of supply chain may enhance the response to outbreak-related disturbances by increasing OSCM flexibility (Ivanov, 2019). A supply chain is a network of enterprises participating in various transformation activities that add value to products and deliver them to consumers (Menguc et al., 2014). Like any other company function, supply chain management requires accurate and timely information (Hult et al., 2004). Channel partners look for novel approaches for delivering correct information in real-time to ensure adequate supply chain movement (Sharma & Khanna, 2020). Information technology is an effective solution to supply chain problems arising from the increasing flow of information and materials in the supply chain network (Huddinia & Er, 2019). Businesses are gradually using data generated from online social media in customer involvement, co-creation and other marketing areas (Devi & Ganguly, 2021).

The supply chain partners in travel, education, hospitality, fashion, and media are familiar with social networking sites. Using online social networks, organizations can improve visibility, communication, management, and lower operational expenses of the supply chain. According to Tóth et al. (2019), supplier actions on social media (SM) aid in developing positive word of mouth, reaching out to targeted buyers, and establishing an interface between supplier and buyer. Using social media to enhance supply chain management may have a positive ripple effect throughout the enterprise. It improves partner cooperation and enables open group discussions. Online social networks help enhance consumer and supply chain interactions, visibility, and sourcing strategies. Consequently, supply chain management will be more efficient and cost-effective. This tool can track logistics, exchange data and information, strengthen relationships, and measure success throughout the supplier network during COVID-19.

The above discussion indicates that it is necessary to investigate the strategic value of OSNs in the supply chain network during COVID-19. However, prior studies explored the significance of online social media platforms for the flow of information, resources, and choices, as well as the establishment of two-way interaction with its stakeholders (Sianipar & Yudoko, 2014), NPD (new product development) Irani et al., 2017), the construction of a sustainable supply chain (Tseng et al., 2019), and disaster management (Yan & Pedraza-Martinez, 2019), daily sales forecasting (Cui et al., 2018), and information dissemination (Kanagarajoo et al., 2019). Besides, Devi and Ganguly (2021) explored that the integration of SM in OSCM increased the availability of a massive quantity of information and enhanced the visibility of communication, information, and knowledge flow in numerous directions. Orji et al. (2020) identified that consumer happiness, adequate security and privacy, cost, and competitive pressure are essential elements that encourage the use of SM in logistics and supply chain.

To the best of our knowledge, little studies have explored the strategic value of OSNs in the supply chain network during COVID-19. Hence, this study set up the objective to explore the strategic value of OSNs in the supply chain network during COVID-19 and tries to fill up the gap by identifying the strategic value of OSNs in the supply chain network. In order to reach the objective, the following research question is developed: Does the adoption of OSNs into the supply chain network add strategic value by boosting supply chain performance during COVID-19? We developed an integrated model based on the IS success model, resource-based view, and absorptive capacity to understand and empirically analyze the strategic value.

This research will enrich the future researcher by introducing OSNs in the supply chain network. It will give persuasive practical implications to organizations regarding the adoption of OSNs in supply chain networks and online social network service providers.

The study reminder is organized as follows: Literature review and research framework are followed by research methodologies. The discussion follows the analysis and findings section. It then discusses the implications for knowledge and policy. Finally, the paper ends with a discussion of future research and limitations.

## **2. Literature review and research framework**

### **2.1. Literature review**

Firms increasingly see supply chain partners as co-responsible for sustainable management (Henriques & Sadorsky, 1999). Technologies like mobile (Xu et al., 2014), cloud computing (Nohadani et al., 2016), RFID (Basole & Nowak, 2018), social media (Colicev et al., 2016), enterprise systems (Duan & Xu, 2016), and business analytics applications (Cao et al., 2015) have changed the way supply chain networks interaction and collaboration. The performance of tourism supply chain is enhanced when the information and communication technology are incorporated (Xiang, 2018). Organizations will have access to a wealth of timely information via social networking about emerging risks and events, enabling them to take corrective action earlier and avert (or decrease the impact of) a supply chain interruption (Gonzalez, 2015). Social media are the channels of information spread by people and businesses (Kietzman et al., 2011). These technologies enhance supply chain performance and have positive effects across the firm, as social media technology has the ability to do (Haque et al., 2022b). These technologies' promise may be seen in easier access to consumer data or improved customer-company communication (Agnihotri et al., 2012). Customers use social media to communicate with others and expect feedback from companies (Trainor et al., 2013). Social media reduces brand information asymmetry by providing a reliable data source for consumers (Tirunillai & Tellis, 2012). Additionally, it increases management, communication, visibility, and management, while also reducing staffing and operational costs (Haque et al., 2022b). Social media competency (SMC) impacts how exporting organizations use social media, affecting their success (Alarcón et al., 2015). Its use grows when suppliers and/or buyers assess external risks (Rapp et al., 2013). Many significant businesses integrate social media into their supply chain management processes. It raises management, enhances visibility, improves communication, lowers operational and labor costs, and increases strategic value of the organization (Sinha, 2019). These technologies assist supply chain managers in gathering information from many sources and supply chain professionals (O'leary, (2011)). Also, several researches broadly have examined social media in supply chain environments (Table 1). For example, supplier involvement in new product development using social media (Cheng & Krumwiede, 2018), integrating social media data into fashion supply chains (Choi, 2018), and social media data analytics in food industries supply chains (Singh et al., 2018).

The literature mentioned above observed that several studies explored social media application from different perspectives. Different scholars used different techniques to analyze data, including PLS-SEM. To our knowledge, very few have attempted to quantify the strategic worth of OSNs in the supply chain network during COVID-19. Hence, there is a significant research opportunity to evaluate our research objective. Thus, this work will add to the literature by merging the IS success model, resource-based view, and absorptive capacity in OSNs and supply chain context.

### **2.2. Research model and hypotheses**

Primarily, the research seeks to assess OSNs' strategic value in supply chain networks. The researchers seek to develop a model for OSNs adoption in supply chain networks-based IS success model, resource-based view, and absorptive capacity. Figure 1 depicts the research framework. The following parts describe the framework's hypothesis:

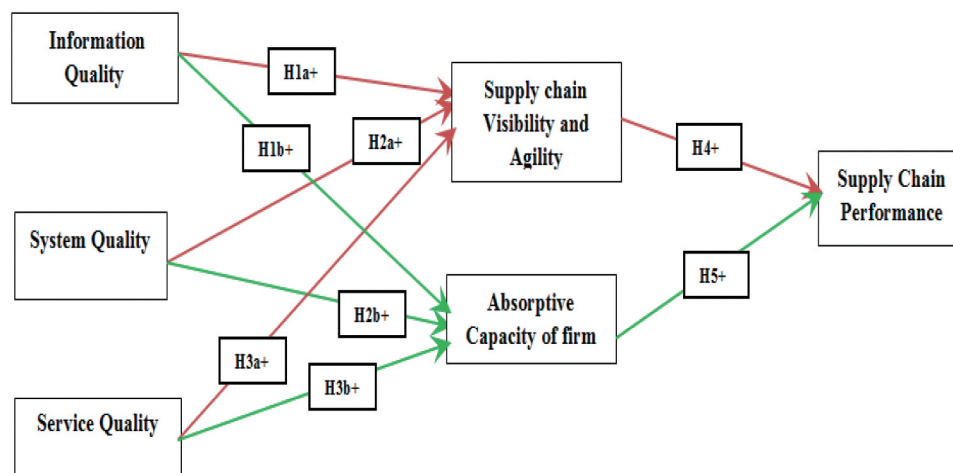
**Table 1. Literature of online social networks (OSNs) in supply chain and related context**

Authors	Research Domain	Method	Findings
Alarcón et al. (2015)	Effect of Social Media Adoption on Exporting Firms' Performance.	Structural Equation modeling using AMOS	Social Media Competence (SMC) impacts the firm's real usage of social media apps, and hence its performance.
Banerjee et al. (2020)	Social media impact on supplier selection	Experimental design	Supplier selection is positively associated with both volume and valence. Deviations from the reference price have a negative moderating effect on the linkages between signals and supplier selection.
Cheng and Krumwiede (2018)	Supplier Involvement in New Product Development Using Social Media	Structural Equation Modeling technique using MPlus	Assisting suppliers in new product development and financial performance using social media and two company skills.
Choi (2018)	Incorporating social media observations and bounded rationality into fashion quick response supply chains in the big data era	Mathematical model	Quick reaction value is influenced by the fashion retailer's past attitude towards market demand.
Muninger et al. (2019)	The value of social media for innovation	Qualitative, theory-building approach	Teams can make decisions faster and share information more easily with the help of social media managers, top management and agile procedures.
Reinecke et al. (2018)	Social relations in Global supply chains	Qualitative approach	Focusing on the function of brokers and border workers in global supply networks
Ramanathan et al. (2017)	Role of social media in retail network operations	Structural equation modeling using partial least squares	Reviewers on social media have a big influence on consumer
Sumarlia et al. (2021)	Risk management in clothing supply chain during the Coronavirus Pandemic	Systematical review	Agile-SC management is more adequate than the lean-SC management mode to cope with the copes with the growing demand uncertainty detected even before the Coronavirus pandemic.
Song et al. (2015)	Social Media's Impact on Supply Chain Sensing	Structural Equation modeling using partial least square	Social media-enabled environmental sensing in turbulent and competitive marketplaces enhances supply chain management's sensing capabilities.
Sigala (2014)	Customer Involvement in Sustainable Supply Chain Management	Qualitative Analysis	Social media encourages consumers to support sustainable tourist supply chain activities.

(Continued)

Authors	Research Domain	Method	Findings
Singh et al. (2018)	Social media data analytics for food supply chain management	Text analysis using a support vector machine (SVM) and hierarchical clustering with multiscale bootstrap resampling	Supply-chain (SC) decision-makers analyze consumer comments and difficulties with food flow/quality on Twitter.
Sibona et al. (2017)	Predicting social networking sites continuance intention through alternative services	ANCOVA and multiple structural equation models	Ongoing social networking sites' survival depends on alternate attraction and attitude toward switching.
Wang et al. (2019)	Block chain technology transform supply chains	Qualitative using sense making theory	The value of using sense making theory to study modern supply chain phenomena like block chains.

**Figure 1. Research Model.**



### 2.2.1. Information quality

Relevance, accuracy, timeliness, and comprehensiveness of information establish information quality (McKinney et al., 2002). The dependability of information provided across supply chain transaction participants is a factor of supply chain visibility and agility (Li & Lin, 2006). Insufficient information confuses users, increases processing costs and complicates organizational operations (Zheng et al., 2013). The majority of users aim to utilize OSNs to engage with others from anywhere and at any time. Supply chain visibility (Barratt & Oke, 2007) is hampered by inaccuracy and latency of shared information. Information quality is typically viewed as a significant antecedent of visibility and absorption capability. Hwang and Rho (2016) explored shared information quality as influential features of supply chain visibility and agility on RFID adoption in supply chain networks.

On the other hand, a firm's absorptive ability will allow it to find, accept, and apply new ideas (Cohen and Levinthal, 1990). It also allows a firm to adapt to changes in the environment (Malhotra et al., 2005). Veeramootoo et al. (2018) considered information quality an influential component to absorption of e-filing systems for continued usage. Stefanovic et al. (2016) explored information quality as a critical factor in the absorption of the e-government system in Serbia. Gao and Bai (2014) identified information quality as an important characteristic for mobile social networking absorption. According to the discussion, the quality of shared information on OSNs



platform will lead to supply chain visibility and agility and OSNs adoption in supply chain network. So we made the assumptions:

**H1a:** The quality of OSNs information will positively contribute to supply chain visibility and agility during COVID-19.

**H1b:** The quality of OSNs information will favorably impact supply chain absorption during COVID-19.

#### 2.2.2. System quality

DeLone and McLean (1992, 2004) defined system quality as usability, availability, dependability, flexibility, and reaction time. Users must wait long for information if OSNs systems are unreliable, difficult to use, and sluggish to respond. In some cases, services may be halted. Online social networks allow supply chain partners to keep track of current events and activities. Poor system quality prevents partners from seeing OSNs. Hwang and Rho (2016) identified the system quality of RFID as a persuasive factor in supply chain visibility and agility. Yang et al. (2017) explored system quality as an essential factor in MOOCs' absorption. Besides, Stefanovic et al. (2016) and Tam and Oliveira (2016) uncovered the system quality as a significant predictor for absorption of e-government and m-banking, respectively. OSNs are more engaged and stable among network participants, which would improve supply chain visibility and agility. Based on these theoretical considerations, we think system quality will improve OSNs visibility and agility and encourage supply chain network absorption. So, here is our plan:

**H2a:** The quality of OSNs systems improves supply chain visibility and agility during COVID-19.

**H2b:** The quality of OSNs systems will favorably impact supply chain absorption during COVID-19.

#### 2.2.3. Service quality

Previous research in several marketing contexts suggests improved service quality results in more loyalty (Nunkoo et al., 2017). DeLone and McLean (2004) show that service quality is crucial for satisfaction and intention to use systems. Several studies have linked e-service quality to e-loyalty (Ahmad et al., 2017; Pee et al., 2018; Toufaily & Pons, 2017). In the context of IS, loyalty indicates whether a user will keep using the systems. The quality of OSNs service provides cooperative assistance in inter-organizational communication to address technical or operational challenges. Many IS experts have confirmed the link between service quality and consumer satisfaction (e.g., S. Lee & Kim, 2017; Lien et al., 2017). Hwang and Rho (2016) identified the service quality of RFID as a significant positive factor in supply chain visibility and agility. On the other hand, Rana et al. (2015) and Roky and Meriouh (2015) explored service quality as influential feature in the absorption of online public grievance redressal system (OPGRS) and industrial information system (XPPS), respectively. Thus, based on discussion, we suggest the

**H3a:** OSNs service quality will improve supply chain visibility and agility during COVID-19.

**H3b:** The quality of OSNs services will significantly impact supply chain absorption during COVID-19

#### 2.2.4. Social networking sites (OSNs) visibility, agility and supply chain performance

The qualitative part of the supply chain relates to an organization's capacity to support entire supply chain operations that lower inventory holding levels, delivery time, and lead time, thus improving supply chain performance (Morash, 2001). Using OSNs, supply chain partners may readily obtain information about various commodities and follow logistical movement in real-



time (D Lee & Park, 2008). The transaction partner advances planning and replenishment procedures to lessen the bullwhip impact (Bottani et al., 2010). Hwang and Rho (2016) uncovered that the visibility and agility of RFID positively contribute to supply chain performance. After implementing OSNs, the organization will effectively share inbound/outbound and transportation information (time, location, etc.), demand information (sales quantity, order change, etc.), inventory information (location, quantity, etc.), customer requirements (order changes) and reconfigures the supply chain process with transaction partners (Goh et al., 2009). Based on the previous studies, we assume supply chain visibility, and agility will improve supply chain performance and accordingly we hypothesize as follows:

**H4:** Supply chain visibility and agility will improve firm performance during COVID-19

#### *2.2.5. OSNs absorption and supply chain performance*

According to IS study, H. Liang et al. (2007) discovered that ERP installation effectiveness is linked to firm absorptive ability. Moreover, absorptive ability relates directly and indirectly to company success (Lichtenthaler, 2009). The ability to absorb and assimilate EDI (an inter-organizational technology) positively correlates with firm performance (Teo et al., 2003). A firm's capacity to absorb technology impacts its effective adoption and successful exploitation of that technology (Bharati et al., 2014). Parveen et al. (2016) identified that the absorption of social media in organizations increases the firm performance by reducing cost, increasing information accessibility, and improving customer relations. Schlagwein and Hu (2017) also explored that social media use types (e.g., dialogue) support organizations' absorptive capacity that leads performance. Based on the previous research, we assume that OSN's absorption capacity in supply chain networks would enhance supply chain performance. We postulate:

**H5:** OSNs absorption in supply chain network will improve firm performance during COVID-19

### **3. Method**

#### **3.1. Research setting**

Because there have been few studies on the strategic value of OSNs in supply chain during the pandemic, an exploratory research study is warranted (Zikmund et al., 2010). The travel, education, hospitality, fashion, and media industries are prone to use OSNs to communicate with their transaction partners. Therefore, the study is conducted from those industries' perspectives. This study's target population is supply chain professionals of five south Asian countries: Bangladesh, India, Pakistan, Sri Lanka, and Nepal. The target respondent is the person who maintains relationships with transaction partners and utilizes online social networking sites (OSNs) in south Asian nations. Researchers adopted the convenience sampling method as the survey instrument because of cost-effectiveness and being widely used in information systems research (Eze et al., 2011; Jha, 2017).

#### **3.2. Measures**

The measurement items of this study were drawn from prior studies. The elements were reassembled to fit the study context of OSNs strategic value in supply chain networks. The scales of Hwang and Rho (2016) and Veeramootoo et al. (2018) are used to assess IQ (information quality) and SQ (system quality). Four items from DeLone and McLean (2004) and Veeramootoo et al. (2018) are used to measure SeQ (service quality). Five items from Hwang and Rho (2016); Goh et al. (2009) are altered to test SVA. Three scales from Bharati et al. (2014); Ettlie and Pavlou (2006) are used to measure AC (absorptive capacity). Finally, four scales from Hartono et al. (2010); Hwang and Rho (2016) are used to measure SCP. Table 2 lists the literature sources and measurement items for each construct.

**Table 2. (Summary of measurement items)**

Constructs	Corresponding Items	Sources
Information Quality (IQ)	<p>IQ1: OSNs provide clear and intelligible information in a generally used format to supply chain network transaction partners during COVID-19.</p> <p>IQ2: OSNs provide access to information among transaction parties in a supply chain network at the desired moment during COVID-19.</p> <p>IQ3: The information included on the OSNs is up to date for supply chain network transaction partners during COVID-19.</p> <p>IQ4: OSNs enable the exchange of precise, authentic, and undeniable information in supply chain networks during COVID-19.</p>	Hwang and Rho (2016); Veeramootoo et al. (2018)
System Quality (SQ)	<p>SQ1: OSNs are simple to employ across supply chain transaction participants during COVID-19.</p> <p>SQ2: OSNs provide a flexible information service with upgrades that meet the needs of supply chain transaction partners during COVID-19.</p> <p>SQ3: OSNs assist in responding rapidly to queries from supply chain network transaction partners during COVID-19.</p> <p>SQ4: OSNs are simple to employ when interacting with supply chain transaction partners during COVID-19.</p>	Hwang and Rho (2016); Veeramootoo et al. (2018)
Service Quality (SeQ)	<p>SeQ1: OSNs streamline and standardize communication between supply chain network transaction partners during COVID-19.</p> <p>SeQ2: OSNs reduce the time required to complete communication with a transaction partner in a supply chain network during COVID-19.</p> <p>SeQ3: The service given by OSNs is fast to react to my demands during COVID-19.</p>	DeLone & McLean, 2004; Veeramootoo et al. (2018)

(Continued)

Constructs	Corresponding Items	Sources
Supply Chain Visibility and Agility (SVA)	<p>SVA1: After implementing OSNs, our company effectively shares inbound/outbound and transportation information (time, location, etc.) with transaction partners during COVID-19.</p> <p>SVA2: After implementing OSNs, our company effectively shares demand information (sales quantity, order change, etc.) with transaction partners during COVID-19.</p> <p>SVA3: After implementing OSNs, our company effectively shares inventory information (location, quantity, etc.) with transaction partners during COVID-19.</p> <p>SVA4: Our company promptly responds to customer requirements (order changes) during COVID-19.</p> <p>SVA5: Our firm flexibly reconfigures supply-chain process with transaction partners to adapt to volatile markets after using OSNs during COVID-19.</p>	Hwang and Rho (2016); Goh et al. (2009)
Absorptive Capacity (AC)	<p>AC1: We can recognize, value, and incorporate external expertise from our business partners during COVID-19.</p> <p>AC2: We are able to effectively combine our previous expertise with fresh information obtained from our business partners during COVID-19.</p> <p>AC3: Organizations that have effectively implemented OSNs in their day-to-day operations during COVID-19.</p>	Bharati et al. (2014), Ettlie and Pavlou (2006)
Supply Chain Performance (SCP)	<p>SCP1: Using OSNs with transaction partners reduced inventory holding levels during COVID-19.</p> <p>SCP2: Using OSNs with transaction partners reduced delivery time during COVID-19.</p> <p>SCP3: Using OSNs with transaction partners reduced lead time during COVID-19.</p> <p>SCP4: Using OSNs with transaction partners reduced the return rate during COVID-19.</p>	Hartono et al. (2010); Hwang and Rho (2016))

### 3.3. Data collection

The information was gathered using a two-part structured questionnaire. Part A comprises demographic, hardware, and OSNs use data, whereas Part B has validated items for the various constructs. The construct items are graded on a seven-point Likert scale, with response options ranging from (1) “strongly disagree” to (7) “strongly agree.” The research’s sample size is 220, ideal for testing structural equation modeling (SEM) (Jr JF Hair et al., 1995). The research used convenience sampling as a survey approach. It is also discovered that data reflect the bulk of demographic differences (see Table 3). The data for this research was collected between November 2020 and January 2021. The e-mail addresses of 990 supply chain managers from various companies

**Table 3. Demographic analysis**

<b>Variables</b>	<b>Description</b>	<b>Frequency</b>	<b>Percentage</b>	<b>Variables</b>	<b>Description</b>	<b>Frequency</b>	<b>Percentage</b>
Age of the Firms	Less than 1 year	18	8%	Online Social Networks platforms used	Facebook	75	34%
	1-5 years	60	27%		YouTube	12	5%
	6-10 years	75	34%		Twitter	31	14%
	11-15 years	45	20%		Whats App	35	16%
	More than 15 years	22	10%		Google+	5	2%
No. of employees of firm in IS dept.	Less than 5	96	44%	Hardware used to access OSNs	LinkedIn	6	3%
	5 to 10	55	25%		All	55	25%
	11 to 15	35	16%		Other	1	0%
	16 to 20	25	11%		Smartphone	124	56%
	21 to 25	6	3%		Laptop	40	18%
	26 to 30	2	1%	Country	Desktop	15	7%
	More than 30	1	0%		Tablet	10	5%
	Travel	32	15%		All	30	14%
	Hospitality	45	20%		Other	1	0%
	Education	38	17%		Bangladesh	90	41%
Industry	Fashion	22	10%		India	54	25%
	Media	25	11%		Pakistan	36	16%
	Manufacturing	58	26%		Srilanka	22	10%
	Less than 50	135	61%		Nepal	18	8%
	50-249	70	32%				
No. of Years of employees	More than 250	15	7%				

were gathered from their respective companies. The survey questionnaire was distributed through e-mail, along with an explanation of the study's objective. It took around 10 to 12 minutes to complete the questions. Five e-mails were sent to all of the e-mail addresses obtained. In early November, the first round was sent out and received roughly 120 responses. Then, four further rounds were distributed from November 15 through 31 January 2021. Finally, we received 268 replies, 48 of which were deleted owing to lack of information, leaving us with 220 responses to analyze. The demographic profile of the participants is shown in Table 3.

### 3.4. Analytic method

A well-known statistical analytic technique, Partial Least Squares (PLS)/variance-based Structural Equation Modeling (SEM), is used to test and validate the proposed integrated model and the interactions among the posited components. SEM is a well-known paradigm for determining model validity using empirical data (Götz et al., 2010). Furthermore, SmartPLS software, a well-known application for assessing measurement models and proposed links (J.F. Hair et al., 2013), is used for data analysis.

## 4. Analysis and results

### 4.1. Organizations' profile

Around 61% of responders are small businesses with 50 workers, while around 32% are medium. Seven per cent of firms employ 250 or more. This is because most big companies do not want to participate in surveys. Firms with less than ten years of operations in market make up around 69% of this survey. It indicates that most businesses are interested in utilizing social platforms, while big and established firms utilize their network. Manufacturing (26%) is the most common Industry represented in this survey, followed by hospitality and education. Compared to other industries, manufacturing businesses use a supply chain network more often. Approximately 69% of respondents have fewer than ten people in their information systems department, while 16% have 11–15 employees. For OSNs, 34% of respondents use Facebook to interact with supply chain partners, followed by WhatsApp (16%). Around 14% of companies use Twitter to communicate with suppliers. 25% utilize all platforms mentioned in the poll. Most supply chain partners (56%) use smartphones, while 18% use laptops for supply chain partner communication. Bangladesh makes up 41% of respondents, followed by India (25%), Pakistan (16%), Sri Lanka (10%), and Nepal (8%), which presents the representation of respondents from each country (see table 3). Data analysis included all demographic variables as control variables, and the statistical outcomes reveal insignificant effect with supply chain performance: firm age ( $\beta = 0.034$ ,  $p = 0.559$ ) measured by the number of years since incorporation, firm size ( $\beta = 0.004$ ,  $p = 0.290$ ) measured by the number of full-time employees, firm IT size ( $\beta = -0.0219$ ,  $p = 0.911$ ) measured by the number of full-time employees in IT department, Industry ( $\beta = -0.006$ ,  $p = 0.623$ ) measured by nature of business. Besides, we estimated two models with and without the control variables. The presence of control variables contributed little to the R square values (Teo et al., 2003). Therefore, we did not consider the effects of demographic variables in the final model.

### 4.2. Common method bias and multicollinearity)

Because the data were cross-sectional, we utilized variance inflation factors to assess for common method bias (VIF). Kock and Lynn (2012) state that a model is free of CMB if all VIF values from a comprehensive collinearity test are equal to or less than 5. Table 4 shows that all factors have VIF below 5. It implies the data are free from bias. It is also found that the correlations between constructs are not extremely high, which are equal to or below 0.812 (see Table 4) that rejected the Bagozzi et al. (1991) statement that If the correlation table shows exceptionally high correlations (more than 0.90) between variables, then there is a common method bias. SmartPLS was also used to investigate potential multicollinearity issues. Structural multicollinearity occurs in the reflective or formative model when the inner or structural VIF coefficients are more than 4.0 or 5.0 (Garson, 2016). The inner VIF values varied from 2.204 to 3.806, indicating that multicollinearity was not a concern in this study (see Table 4).

#### 4.3. Measurement model

For the investigation, SmartPLS 3.0 was employed. We used Anderson and Gerbing (1988) two-step statistical analysis approach to assess the measurement model in SEM. Internal consistency and dependability are assured when Cronbach's alpha and composite reliability  $\geq 0.70$  (Jr JF Hair et al., 1995). Table 5 illustrates the study's Cronbach's alpha ranged from 0.919 to 0.951 and composite reliability from 0.943 to 0.964. The study's internal dependability is above the threshold value of 0.70. We employed two Fornell and Larcker (1981) standards to assess convergent validity.

First, the value of each item loading should be  $\geq 0.70$ , and second, the AVE of each construct should exceed the construct variance (due to measurement error from constructions), and the threshold value should be equal to or more than 0.50. Table 5 shows that all items of loadings were over 0.70, and AVE values were likewise above 0.50 for our measurement model (Fornell & Larcker, 1981; J.F. Hair et al., 2013). Thus, the investigation validated the suggested measurement model's convergent validity.

Although most of the studies used Fornell and Larcker criterion for assessment of discriminant validity, Henseler et al. (2015) justified that neither the Fornell-Larcker criterion nor the assessment of the cross-loadings allows users of variance-based SEM to determine the discriminant validity appropriately. Henseler et al. (2015) and Voorhees et al. (2016) strongly proposed the heterotrait-monotrait ratio of correlations (HTMT) as a new approach to assess discriminant validity in variance-based SEM. It is also used in marketing and adopted in other disciplines (Kuppelwieser et al., 2019; Ronkoo and Cho, 2020). Henseler et al. (2015) recommended that HTMT value  $\leq 0.90$  (Gold et al., 2001) is acceptable and HTMT value  $\leq 0.85$  (R. B. Kline, 2015) is considered as strictest standards. Table 6 presents that all values are less than the strictest standards ( $\leq 0.85$ ) of R. B. Kline (2015) and ensure the discriminant validity of our data.

#### 4.4. Estimation of model fitness

Since this study employed Smart-PLS, we used various indices produced by Smart-PLS to estimate the overall model fitness. We used four model fitting parameters: 1. Standardized Root Mean Square Residual (SRMR), which values less than 0.08 (Hu & Bentler, 1999), is considered a good fit. 2. Normed fit index (NFI), which computes the proposed model's Chi-square value and compares it to a meaningful benchmark (NFI values over 0.9 generally imply adequate fit) (Hu & Bentler, 1999). 3.  $d\_ULS$  (the squared Euclidean distance) 4.  $d\_G$  (the geodesic distance). The third and fourth fit values are exact model fits that examine the statistical (bootstrap-based) inference of the gap between the actual covariance matrix and the covariance matrix predicted by the composite factor model. Henseler et al. (2016) reported that a model is well fitted when  $d\_ULS$  and  $d\_G$  < than the 95% bootstrapped quantile (HI 95% of  $d\_ULS$  and HI 95% of  $d\_G$ ).

The software produced value suggests our model is well fitted since the SRMR value is 0.034 ( $< 0.08$ ), the NFI is 0.913 ( $> 0.90$ ), the  $d\_ULS$  < bootstrapped HI 95% of  $d\_ULS$  and,  $d\_G$  < bootstrapped HI 95% of  $d\_G$  (See Table 7). Our structural model significantly proves the relationship among different constructs (Hair et al., 2011), and we can proceed to examine the path coefficient of the structural model.

#### 4.5. Hypotheses results

The research employed SmartPLS 3.0 to test the predicted links between constructs. Figure 2 illustrates the structural model's route coefficients. Since ( $p$  0.000,  $\beta$  0.348,  $t$  = 4.770) we cannot reject hypothesis (H1a). It shows that the information quality of online social networks affects its absorption capability. Information quality does not show statistically positive effect on supply chain visibility and agility (at  $p > 0.05$ ,  $\beta$  = 0.143,  $t$  = 1.683). So H1b is not supported. We cannot support hypothesis (H2a) because system quality has no effect on absorption capacity ( $p > 0.05$ , 0.064,  $t$  = 0.810). Although H1b and H2a are not supported statistically, they positively impact supply chain visibility and agility and absorption capacity. This may happen due to the

**Table 4. Correlation and descriptive statistics**

Constructs	VIF	Correlation
Absorptive Capacity	2.244	1.000
Information Quality	2.808	0.721
Supply Chain Performance	3.906	0.812
Service Quality	3.806	0.746
System Quality	3.660	0.709
Supply Chain Visibility and Agility	2.204	0.745

unconsciousness of a supply chain professional about OSNs information quality and system quality using OSNs.

But system quality of online social networks has a significant positive impact on supply chain agility and visibility because the software produced value is statistically significant (at  $p < 0.05$ ,  $\beta = 0.178$ ,  $t = 1.982$ ). However, service quality has a statistically significant positive influence on absorptive capacity ( $p = 0.000$ ,  $r = 0.433$ ,  $t = 5.956$ ). So H3a is supported. Furthermore, service quality statistically impacts supply chain agility and visibility ( $p = 0.000$ ,  $r = 0.524$ ,  $t = 6.245$ ). So we cannot reject H3b. Surprisingly, supply chain visibility and agility have a greater impact on supply chain network performance. The calculated value is significant at ( $p = 0.000$ ,  $r = 0.392$ ,  $t = 4.184$ ). So we support the hypothesis (H4). Finally, online social network absorption capacity is very significant ( $p = 0.000$ ,  $r = 0.520$ ,  $t = 5.412$ ); hence, we support H5 (see Table 8 for details). It shows that online social networks' absorption power improves supply chain performance. When organizations effectively adopt and apply this technology for supply chain operations, the supply chain network performs better during COVID-19.

The predictive power (R square) of dependent variables like SCP is 0.728, AC is 0.619, and SVA is 0.639. All values exceed the required threshold of 33% of Chin (1998) & Höck and Ringle (2006). The research model reports a 72.8% variance of SCP, 61.9% variance of AC, and 63.9% variance of supply chain visibility and agility of online social networks.

Additionally, we looked at the  $f$  square effect size to see whether the study model was significant. Cohen (1988) recommended 0.02 for "small", 0.15 for "medium" and 0.35 for "high" effect sizes. In the current model, supply chain performance ( $f$  square = 0.251), visibility and agility ( $f$  square = 0.234), and absorptive capacity ( $f$  square = 0.241) have medium impact sizes.

#### 4.6. Mediation analysis

To assess the mediation impact of absorptive capacity, we used SmartPLS bootstrapping indirect effect of mediator between predictors and outcomes (Preacher & Hayes, 2008).

Table 9 shows that absorptive capacity is a mediator between information quality and supply chain performance ( $\beta = 0.181$ ,  $t = 3.586$ ,  $p = 0.000$ ), and absorption capacity is a full mediator between service quality and supply chain performance ( $\beta = 0.225$ ;  $t = 3.781$ ;  $p = 0.000$ ). However, the statistical value ( $\beta = 0.033$ ,  $t = 0.764$ ,  $p > 0.10$ ) does not support absorptive capacity as a mediator between system quality and supply chain performance.

Supply chain visibility and agility ( $p < 0.10$ ) mediate between information quality and supply chain network performance (Table 10). Furthermore, supply chain visibility and agility are proven as mediators between service quality and supply chain performance ( $\beta = 0.205$ ,  $t = 3.273$ ,  $p < 0.01$ ). Finally, supply chain visibility and agility mediate between system quality and supply chain performance ( $p < 0.05$ ). In this study model, supply chain visibility and agility flawlessly are mediators between information, system, service quality, and supply chain performance.



**Table 5. Measurement model**

Constructs	Indicators	Loading	Cronbach's Alpha	CR	AVE
Information Quality	IQ1	0.908	<b>0.936</b>	<b>0.954</b>	<b>0.839</b>
	IQ2	0.926			
	IQ3	0.923			
	IQ4	0.907			
Absorptive Capacity	AC1	0.947	<b>0.945</b>	<b>0.964</b>	<b>0.900</b>
	AC2	0.957			
	AC3	0.942			
Supply Chain Performance	SCP1	0.925	<b>0.945</b>	<b>0.960</b>	<b>0.858</b>
	SCP2	0.937			
	SCP3	0.933			
	SCP4	0.911			
Service Quality	SEQ1	0.913	<b>0.919</b>	<b>0.949</b>	<b>0.861</b>
	SEQ2	0.946			
	SEQ3	0.924			
System Quality	SQ1	0.870	<b>0.919</b>	<b>0.943</b>	<b>0.805</b>
	SQ2	0.907			
	SQ3	0.906			
	SQ4	0.905			
Supply Chain Visibility and Agility	SVA1	0.909	<b>0.951</b>	<b>0.962</b>	<b>0.835</b>
	SVA2	0.926			
	SVA3	0.932			
	SVA4	0.888			
	SVA5	0.914			

Legend: AVE = Average Variance Extracted; CR = Composite Reliability

**Table 6. Heterotrait-monotrait ratio (HTMT)**

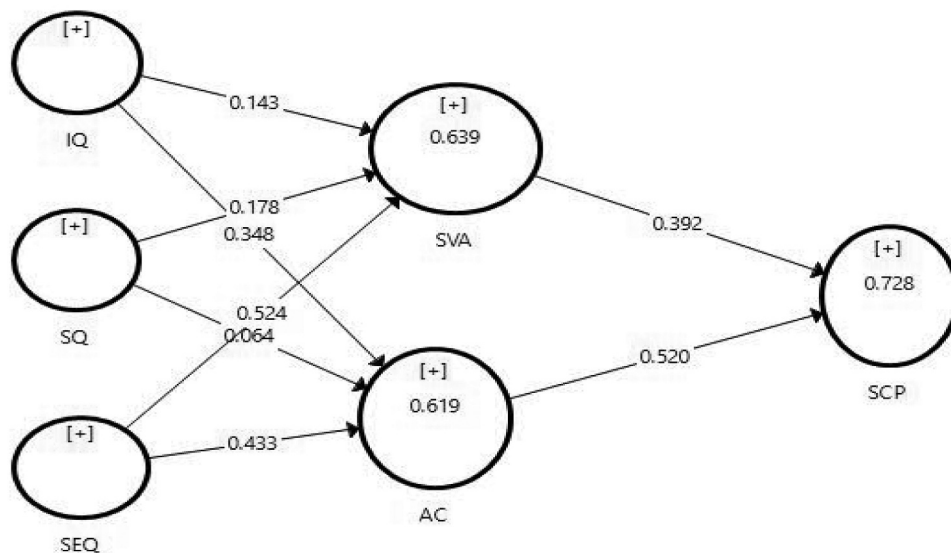
	AC	IQ	SCP	SEQ	SQ
Information Quality (IQ)	0.766				
Supply Chain Performance (SCP)	0.858	0.707			
Service Quality (SEQ)	0.801	0.804	0.746		
System Quality (SQ)	0.761	0.855	0.701	0.831	
Supply Chain Visibility and Agility (SVA)	0.785	0.714	0.822	0.837	0.790

## 5. Discussions

The findings of this investigation significantly support the research model in Figure 1. The study's findings suggest a 75% directional correlation between latent variables. The research model has an R square of 63.98% for supply chain visibility and agility, 61.98% for absorptive capacity, and 72.8% for supply chain performance. Whereas the study of Hwang and Rho (2016) on the strategic value of RFID explains R square 60% the supply chain performance. In addition, previous studies

Table 7. Model fit summary			
Parameters	Saturated Model value	Recommended value	Sources
SRMR	0.034	≤ 0.08	Hu & Bentler, 1999
d_ULS	0.314	< than the 95% bootstrapped quantile (HI 95% of d_ULS)	Henseler et al. (2016)
d_G	0.500	< than the 95% bootstrapped quantile (HI 95% of d_G)	Henseler et al. (2016)
NFI	0.913	≥ 0.9	Hu & Bentler, 1999

**Figure 2. Validated research model.**



on IS adoption show R square 44.1 percent (M. Z. Haque et al., 2022a), R square 45.6 percent (Haque et al., 2020a), R square 55.0 percent (Haque et al., 2019), 47.8 percent (Haque & Khan, 2020), and R square 38.7 percent (Haque et al., 2020b). This result implies that the suggested research model explains a significant fraction of supply chain performance variance and exceeds

**Table 8. Structural model**

Hypothesis	Constructs Relationship	Std.Beta	T Statistics	P Values	Decision
H1a	IQ -> AC	0.348	4.770***	0.000	Supported
H1b	IQ -> SVA	0.143	1.682	0.093	Not Supported
H2a	SQ -> AC	0.064	0.810	0.418	Not Supported
H2b	SQ -> SVA	0.178	1.982*	0.048	Supported
H3a	SEQ -> AC	0.433	5.956***	0.000	Supported
H3b	SEQ -> SVA	0.524	6.245***	0.000	Supported
H4	SVA -> SCP	0.392	4.184***	0.000	Supported
H5	AC -> SCP	0.520	5.412***	0.000	Supported

Legend: Std.Beta: Standard Beta; p: significance: \*p < 0.05; \*\* p < 0.01; \*\*\*p < 0.001

**Table 9. Mediation effect of absorptive capacity**

Constructs Relationship	Std.Beta	T Statistics	P Values
IQ -> AC -> SCP	0.181	3.586***	0.000
SEQ -> AC -> SCP	0.225	3.781***	0.000
SQ -> AC -> SCP	0.033	0.764	0.445
IQ -> SVA -> SCP	0.056	1.690*	0.092
SEQ -> SVA -> SCP	0.205	3.273***	0.001
SQ -> SVA -> SCP	0.070	2.100**	0.036

Legend: Std.Beta: Standard Beta; p: significance: \*p < 0.10; \*\*p < 0.05; \*\*\* p < 0.01

previous studies explanation power. Several obvious conclusions are drawn from this strategic research model:

First, the service quality feature of OSNs is the strongest predictor of supply chain performance because service quality has emerged as an influential determinant of supply chain visibility and agility and the absorptive capacity, with the most incredible path coefficient. This finding is unfailing with Rana et al. (2015) and Roky and Meriouh (2015), who found service quality is an essential attribute for the adoption of OPGRS and industrial information system (XPPS), respectively. This result also supports the findings of Hwang and Rho (2016), where they found service quality of RFID has significant influence on supply chain visibility and agility which enhance supply chain performance. In addition, this result is also consistent with the findings of Haque et al. (2022b) where they explored information quality has significant impact on tourism supply chain network performance. The service quality of online social networks significantly impacts supply chain experts during COVID-19. Supply chain professionals emphasize on service quality to enhance the strategic value of OSNs in supply chain network. It confirms the strategic value of online social networks for tourism supply chain professionals to communicate with their associates on the south Asian countries during a pandemic brought on by COVID-19.

Second, the Information quality has revealed an influential feature to assess the strategic value of OSNs in supply chain networks because its influence on absorptive capacity is statistically significant. This result confirms the findings of Veeramootoo et al. (2018), Stefanovic et al. (2016) and Gao and Bai (2014) in the adoption of e-filing, e-government and mobile social networking, respectively. This finding suggests that during pandemics, the information quality of online social networks strongly encourages supply chain professionals to engage with their partners in South Asian countries. On the other hand, information quality improves supply chain visibility and agility, although this influence is not statistically significant. This result is consistent with the findings of Haque et al. (2022b) where they explored information quality has not significant impact on tourism supply chain network performance. This result contradicts Hwang and Rho (2016), where they found that information quality is an important factor in assessing the strategic value of RFID in supply chain networks. In light of the information quality characteristic of OSNs during the COVID-19 situation, it appears that supply chain experts are more focused on adoption than on SCN's visibility and agility.

Third, the System quality of OSNs significantly improves supply chain visibility and agility, boosting the organization's supply chain performance during COVID-19 situation. This outcome confirms the findings of Hwang and Rho (2016), where they identified the system quality of RFID as a persuasive factor in supply chain visibility and agility in assessing strategic value. In contrast, system quality does not influence an organization's absorptive ability. This result contradicts the findings of Stefanovic et al. (2016) and Tam and Oliveira (2016), where they uncovered the system quality as a significant predictor for absorption of e-government and m-banking, respectively. It suggests that in the context of OSNs' system quality feature under COVID-19, supply chain professionals are more focused on agility and visibility than on adopting SCN. This may occur because supply chain experts use the systems to make the supply chain visible during COVID-19 rather than worrying about OSNs' adaptability.

Fourth, the study revealed absorptive capacity as a predictor of supply chain performance. The findings show that online social networks absorption capability is the most critical element affecting supply chain performance in the COVID-19. The finding suggests that businesses with different absorptive capacities may use OSNs and other new information delivery technologies during COVID-19. This study has limited information on this issue since absorptive capacity is a novel concept in OSNs and the supply chain. This finding is similar to that of Bharati et al. (2014) and Schlagwein & Hu, (2017), where they explored the absorptive capacity as a factor of organization performance. This outcome is also unfailing with Parveen et al. (2016), where they identified absorption of social media in organization increase the firm performance by reducing cost,

increasing information accessibility and improving customer relations. This finding looked at how the performance of the supply chain during COVID-19 was enhanced by the incorporation of OSNs.

Furthermore, our findings imply that online social networks boost supply chain performance during pandemics by enhancing supply chain agility and visibility. This conclusion is consistent with Hwang and Rho's (2016) findings which show that supply chain agility and visibility boost supply chain performance. This result also demonstrates that, following the implementation of OSNs, supply chain professionals will be able to effectively communicate with transaction partners about inbound/outbound and transportation information (time, location, etc.), demand information (sales quantity, order change, etc.), inventory information (location, quantity, etc.), and customer requirements (order changes). This result in the context of COVID-19 illustrates the usefulness of OSNs in improving the performance of supply chain networks.

Besides, the study also looked at the function of absorptive capacity, supply chain agility, and visibility as mediators. According to the indirect impact, supply chain agility and visibility completely mediate the relationship between information quality, system quality, service quality, and supply chain performance. On the other hand, Absorptive capacity bridges between the outcome variable and latent variables except for system quality

Finally, all strategic values related to the OSNs, such as supply chain visibility, supply chain agility, and supply chain absorptive ability, have a positive impact on supply chain performance. As a result, organizations who are worried about the performance of OSNs deployment should focus more on maximizing the strategic benefits of the OSNs system while also guaranteeing consistent management of the quality parameters. These strategic benefits of OSNs systems in supply chain networks should not be disregarded by companies who are skeptical about their adoption and implementation.

## 6. Implications

Since there is a rare study regarding the strategic value of online social networks in supply chain networks during COVID-19, the research will have significant theoretical ramifications. The strategic value model is developed based on IS success model, resource-based perspective, and absorption capacity. It will introduce a new model in supply chain management and the social media research domain. The major strategic values of OSN, supply chain networks, in particular, are supply chain agility, visibility, and absorptive capacity, which have rarely been explored in past literature. Additionally, the strategic value model in the context of the supply chain will assist in providing a thorough explanation of the many technical difficulties relating to OSNs from the viewpoint of a OSNs implementer. It introduces supply chain visibility, agility, and absorption capacity as a mediator for the strategic value model to evaluate the strategic value of OSNs in the supply chain network. This will enhance the supply chain and social media literature by incorporating a new mediator. This research expands the subject of OSNs to the adoption stage at the supply chain network level, improving communication among transaction partners, which is seldom covered in preceding social media literature. That will add to the supply chain, social media, and supply chain information systems literature.

This paper outlines the tactical considerations for maximizing the value of OSNs supply chain networks. Because supply chain performance is impacted by supply chain agility, visibility, and absorptive capacity. In order to create cutting-edge supply chains for COVID-19, partners should cooperate cooperatively to alter their interdependent working processes through the OSNs system. It will guide supply chain managers to use OSNs to communicate with transaction partners since OSNs are a new communication platform. It will enable the tourism, education, hotel, fashion, and media sectors to embrace OSNs in their supply chains. OSNs spread user-generated content through electronic word of mouth (eWOM). The results demonstrated user-generated material for supply chain experts and will aid online social networks service providers to develop novel services that include supply chain network communication elements in their platforms'.

## 7. Research limitations and future direction

This research contains a few minor flaws. The research analyzed cross-sectional data from supply chain specialists from five south Asian nations to test the suggested research model experimentally. Longitudinal data may be utilized to assess the model's performance in the future. The research employed non-random sampling, and future research can use random sampling. Information quality has statistically minor effect on supply chain visibility, agility. In addition, system quality has insignificant influence on absorptive capacity. Future research should establish acceptable scales for these latent variables and revalidate the study's model with new measures. Finally, although the suggested research model explains 72.8 per cent of supply chain performance variation, future studies might uncover and examine other borderline circumstances of the research model.

## 8. Conclusion

This study integrated IS success model, absorptive capacity, and resource-based perspective to uncover the strategic importance of OSNs in supply chain networks during COVID-19. The research model properly explains the strategic use of online social networks. This model's six hypotheses have favourable associations. The empirical evidence shows that online social network' information, system, and service quality positively impact supply chain visibility, agility, and absorption capacity, resulting in improved supply chain performance. Two novel mediator supply network visibility, agility, and absorption capacity were also developed and experimentally validated in this research model for the supply chain context. Overall, the study emphasizes the importance of research model in the context of OSNs in supply chain information systems, online social media and supply chain networks. Finally, this study's conclusions will help firms, regulators, and OSN service providers design strategies based on empirical data.

### Author details

Md. Ziaul Haque<sup>1</sup>

E-mail: [zia10093@yahoo.com](mailto:zia10093@yahoo.com)

ORCID ID: <http://orcid.org/0000-0002-2124-7753>

Md Shariful Islam<sup>2</sup>

Santus Kumar Deb<sup>3</sup>

Md. Rashidul Islam<sup>4</sup>

<sup>1</sup> Department of Management Information Systems, Noakhali Science and Technology University, Noakhali, Bangladesh.

<sup>2</sup> Department of Economics, Bangladesh University of Professionals, Dhaka, Bangladesh.

<sup>3</sup> Department of Tourism and Hospitality Management, University of Dhaka, Dhaka, Bangladesh.

<sup>4</sup> Department of Business Administration, East West University, Dhaka, Bangladesh.

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