Towards a Sustainable Supply Chain Management: Integration of the CSR Approach in Inter-companies' Relations (subcontracting)

AOUETTA Sara [1*], DERGHOUM Mahfoud [2]

[1] Laboratory M.A.G.I.P.O, high school of commerce (Algeria), E-mail : s_aouetta@esc-alger.dz ,

[2] Laboratory M.A.G.I.P.O, high school of commerce (Algeria), E-mail: m_derghoum@esc-alger.dz

Received: 21/03/2022 *Accepted: 07/08/2022* *Published:31/01/2023*

Abstract:

The fundamental notion is that the firm needs to collaborate with other parties to complete itself. This study seeks to determine the diffusion of CSR approach on supply chain management by analysing the relationship between contractors/ subcontractors and their suppliers by analysing 58 questionnaires diffused on Algerian business leaders and senior executives, we chose the method of structural equations for data analysis with SmartPLS 3 software.

The results confirmed that the integration of CSR approach in inter-companies relations effect positively it integration in supply chain management, therefore we have confirmed our research hypothesis.

Keywords: *subcontractors; contractors; CSR approach; Supply chain management, Suppliers; Smart PLS v 3*

1. INTRODUCTION:

During the last few decades, companies and businesses have witnessed many changes in several areas such as, social, economic, technological and political field. these changes where fast and major.

CSR is now the concern of all actors, in order to remain competitive, companies are obliged on; the one hand to integrate the dimensions of CSR (even if this approach remains voluntary) and on the other hand; to create and maintain their relationships with other entities.

These changes have influenced the relationship between companies, among these relationships subcontracting, which is a type of contractor who works in a specialized area with an independent contractor, or vendor. While the contractor maintains relationships with clients, the subcontractor works with a contractor, providing their specialized skill set in exchange for a contractual fee.

---

* ***Corresponding author***

It is not frequently easy in reality to distinguish between a subcontractor and a supplier. (Baudry & Bouvier-Patron, 1994)

The supplier is, under a sales contract, responsible only for the delivery, after manufacture, of materials, products or construction components not comprising exceptional specifications provided by the principal. He therefore does not participate in the execution of the specific services of the buyer's specifications. However, the subcontractor has an obligation to do, reflecting its real participation in the performance of the contract.

- **Problem of the study:**

According to (Mabrouk, Sperandio, & Girard, 2012) The implementation of social responsibility is an opportunity for the company to define a new strategy and new challenges that must be analysed by the compagnies and between companies, for that our research question is:

How can the implementation of a CSR approach contribute to create value within inter-companies' relationship in order to achieve a sustainable supply chain management?

To answer this research question, our reflection led us to have a double questioning:

- ✓ How to increase the consideration of CSR issues in the contractors/ subcontractor's relationship?
- ✓ How to build a constructive partnership between principals and subcontractors and between subcontractors and their suppliers?

- **Hypothesis of the study:**

According to (Hila & Dumitrascu, 2014) subcontracting is a type of work contract that seeks to outsource certain types of work to other companies to provide services or products that might otherwise be performed by principal, in order to reduce costs.

To answer the questions, we need to test the validity of this hypothesis:

H: the integration of CSR in inter-company relations increases the creation of value for different partners throughout the supply chain to achieve sustainable supply chain management.

We divide this hypothesis into four sub-hypotheses:

H1: partnership between contractors and subcontractors affects positively the diffusion on the supply chain management

H2: The integration of CSR by contactors affects positively constructive the partnership between contractors & subcontractors.

H3: The integration of CSR by subcontractors affects positively constructive the partnership between contractors & subcontractors.

H4: The integration of CSR by suppliers affects positively constructive the partnership between contractors & subcontractors.

- **Objectives of the study:**

Through this study, we try to achieve the following objectives:

- ✓ to provide clarification on the motivations of the CSR approach in supply chain management through subcontracting
- ✓ to explore the relationship and interaction between (supplier, subcontractors and contractor) and the CSR practices, focusing on a sample of several Algerians companies. For the analysis and the validation of the results, we used Smart PLS version 3 software.

- **Importance of the study:**

The importance of our study is to provide clarification on the motivations of the CSR approach in supply chain management through subcontracting that have become the concern of many of Algerian economic institutions and companies because for a business leader's point of view subcontracting allows the contractors to focus on its core business, which will free up resources to be used in other areas.

The integration of CSR practices through the partnership between the principals and the subcontractors and their suppliers can lead to a sustainable supply chain management.

This paper is organised as follows, the review of literature of the main concepts used in our research is summarized in the first section, the methodology, the sample and its characteristics, as well as the measurement scales of the variables studied are explained in the second section, the results and main conclusions of the investigation will be exposed in the last part.

2. Literature review:

This section presents a global view of supply chain management and the link between the concepts of our study: the integration of CSR in inter-organisational relationship such as contractors / subcontractors / suppliers and the sustainable supply chain management:

2.1. Supply chain management (SCM):

Supply chain management is the subject of much research because its study is multi-disciplinary for that, there are several and many definitions of supply chain management we can find:

According to (Belin-Munier, June, 2010) Supply Chain Management is a strategic and holistic approach to demand management, operations, supply and logistics processes.

(Liao & Widowati, 2021) In their study, Supply Chain Management

refers to suppliers, manufacturers, warehouses, distribution centres, and distributors who attempt to minimize the cost of the entire sup- ply chain system while meeting certain customer service levels. Management methods for product manufacturing, transhipment, distribution, and sales are effectively organized together.

We find also in the study of (Harland, 2013) the definition of supply chain management as: « The management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers », we have retained this definition for our study because the objective of the study is to explore inter - companies' relationships and the integration of CSR approach.

2.2. Integration of CSR in inter-companies Relationship:

Companies have to integrate the CSR dimension to remain in international supply chain because supply chain actors especially buyers use CSR codes for ensuring clarity in communication to achieve a ethic business (Rahim & Wisuttisak, 2013)

(Brodhag & Tahiri, 2011) In their study of Engineering project management, the perspective in study was to prove that the integration of CSR policy directly into the project process could facilitate exchanges and the transmission of knowledge between all the actors (suppliers, principals, subcontractors …etc.)

(Ng & Luu, 2008) Proposed that the coordination and schedule management in subcontracted works have to be improved through the concept of partnering between contractors and subcontractors focusing on the best value.

In a stable business environment, the firm needs to collaborate with others firms to involve partnering with suppliers and subcontractors, and also to ensure effective customer relations, these will plan and perform supply chain activities. (Baba, Wang, Adzani, & Abdul-Hamid, 2021)

In addition, (Quairel & Auberger, 2007) show that, one of the key areas of CSR performance is the integration of economic, social and environmental criteria in supply chain management by the dissemination of responsible practices among suppliers and subcontractors of the companies.

2.2 Sustainable supply chain management (SSCM):

The performance of supply chain depends on the supply chain practice activities which include information quality, integration intensity, information sharing with company partners and strategic supplier partnerships (Tarigan, Jiputra, & Siagian, 2021).

(El aidouni & Abbassi, 2012) Illustrate that "win-win" strategy between the supplier and the principals to create a real CSR approach for the supply chain.

(Sundram, Chhetri, & Bahrin, 2020) share that supply chain practices which consist of supplier selection and evaluation, supplier manages inventory, investment recovery, eco-design and packaging, reverse logistics. We add that supply chain practices that focus on the environment are called green supply chain management, supply chain practices when they focus on corporation with customers and social dimensions are called social supply chain management, the entire; green supply chain and the social supply chain as well as the supply chain in its economic vision give rise to sustainable supply chain management.

(Wolf, 2011) define Sustainable supply chain management as the strategic and transparent integration and achievement of an organization's social, environmental and economic objectives in the systemic coordination of key interorganizational business processes for improving the long-term economic, social and environmental performance of the individual organization and its supply chains. In addition, (Craig R. Carter & Rogers, 2008) illustrate That the systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole.

After clarifying the summaries of those previous studies, the added value of our article is in the adoption of CSR in supply chain management and the perspective of Algerian companies to use the subcontracting for two reasons. First, national subcontracting can develop and rise the economic national integration. Second subcontracting may promote the creation of a long-term partnership.

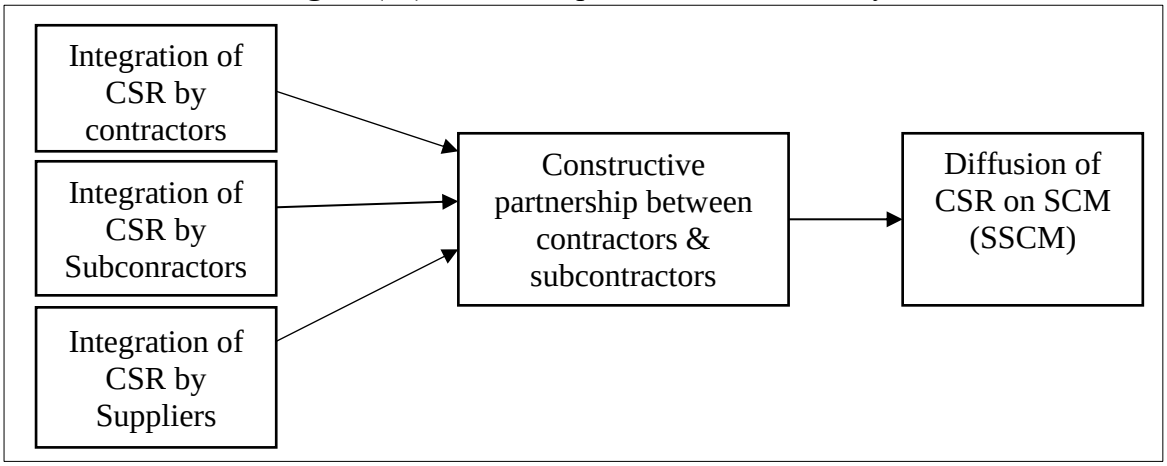
2.3 Conceptual model of the study:

The problem of our study was about the implementation of a CSR approach within inter-companies' relationship in order to achieve a sustainable supply chain management from this, we can provide preliminary answers of our hypothesis previously mentioned:

H: the integration of CSR in inter-company relations increases the creation of value for different partners throughout the supply chain to achieve sustainable supply chain management.

The conceptual model of our study is as flows:

Fig N^0 (01): The conceptual model of the study



Source: prepared by researchers

3. Methods and materials:

The goal of this research is to explore the relationship between the integration of CSR in inter-companies' relations and sustainable supply chain management

3.1 Population and sample study:

The survey took place voluntarily during the study days on "Subcontracting and National Integration: Challenges and Perspectives" from May 18 to May 19, 2021 at the Polytechnic Military School of Algiers in collaboration with the National Institute of global strategic studies where several organizations in several fields of activity were present ,approximately (40 public companies and 21 private companies), a questionnaire of 05 pages was distributed to the participants (business leaders, senior executives, etc.). Out of 200 questionnaires distributed, 64 questionnaires were returned, we excluded 06 questionnaires because the answers were incomplete, we can say that the sample of our study is 58.

3.2 Study tool:

The questionnaire was designed according to the theoretical background, it contains 4 axes. We used Likert scales ranging from "Totally agree" to "Totally disagree" these scales contain a set of items to express the views of our study. The method of structural equations for data analysis with SmartPLS software Version 3 was adopted to facilitate the analysis process.

3.3 Statistical methods:

The use of Smartpls 3 software allows us to evaluate and test the measurement model and the structural model. In the measurement model, we

check: the convergent validity by (factor loadings > 0.7); internal consistency (Composite Reliability CR index> 0.7) and the Average Variance Extracted (AVE) >0.5). To validate the structural model, we check: the Coefficient of determination-R^2, the Effect size- f^2, Predictable relevance Q^2 and the Hypotheses test – path coefficient**.**

In order to ensure the suitability of the questionnaire and it paragraphs (Items), the Alpha cronbach coefficient was used to check the stability, which must be higher than 0.6

4. Results:

4.1 Descriptive analysis:

The following table shows the profile of respondents:

Table N^0 (01): Descriptive analysis of the surveyed population

Organisation types			
		Frequency	Percentage %
Valid	Private group	4	6,9
	Public group	17	29,3
	Private company	12	20,7
	Public company	16	27,6
	organism or administration	9	15,5
	Total	58	100,0

Activity field			
		Frequency	Percentage %
Valid	steel, metallurgy, mechanics and electronics	11	19,0
	energy, mining and renewable energy	8	13,8
	manufacturing and food industry	9	15,5
	Pharmacy	9	15,5
	construction, public works and hydraulics	3	5,2
	service and logistics	3	5,2
	new information technologies and digitalization	1	1,7
	others	10	17,2
	Total	54	93,1
Missing	9	3	5,2
	System	1	1,7
	Total	4	6,9
Total		58	100,0

Respondent's function

		Frequency	Percentage %
Valid	Business leader	36	62,1
	Executive senior	17	29,3
	senior	3	5,2
	others	2	3,4
	Total	58	100,0

Source: prepared by researchers based on SPSS v 28 program outputs

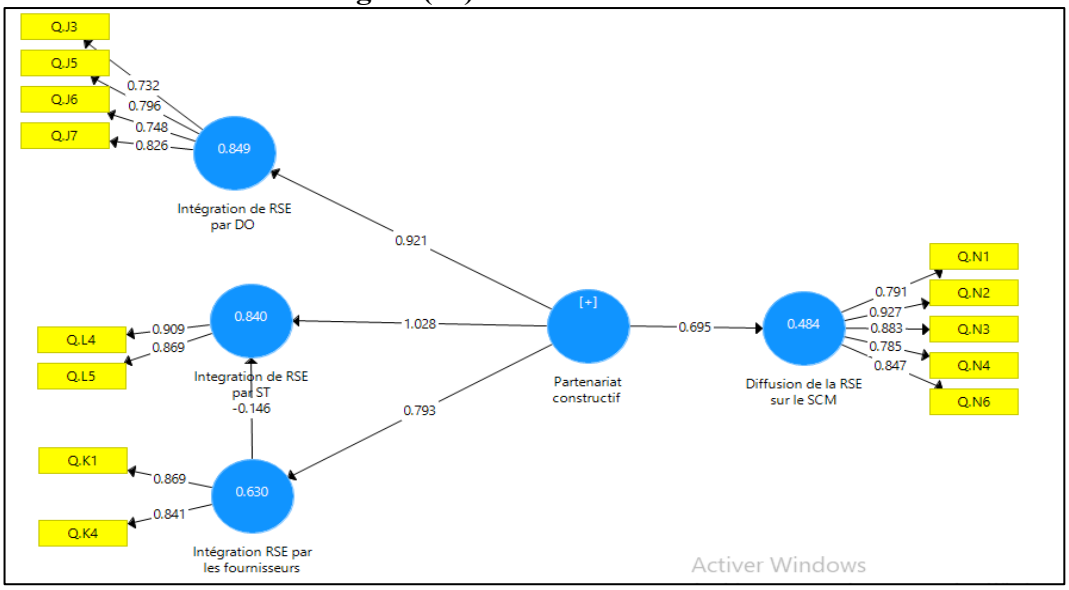
4.2 Assessment of the measurement model

The measurement model illustrates the relationship between the variables and the indicators (items) that measure these variables.

(Hair, Bill , Barry, & Rolph, 2006) Suggest that we should use the reliability of items which is considering suitable values are values that exceed 0.70. In our study the (Q.J1, Q.J2, Q.J4, Q.K2, Q.K3, Q.L1, Q.L2, Q.L3, Q.L6, Q.N5) indicators have been removed from the model, because their outer loading was less than 0.70

The following figure shows the relationship between the dependent variable and the independent variable of our study:

Fig N^0 (02): The measurement model



Source: Smart PLS version 3 software

4.2.1 Convergence validity

Convergence validity is the degree to which multiple items to measure the same concepts are in agreement.

The N^0 (02) combine the values of the factor loading, CR and AVE. It shows the results of the convergent validity, all values of the external loads

exceeded 0.6, which agrees with (Bagozzi & Yi, 1998) suggest.

The Analysis of the N^0 (02) allowed us to see that the composite reliability of the latent variables exceeded 0.70, which is recommended by (Hair, Hult, Ringle, & Sarstedt, 2016), also as suggested by (Fornell & Larcker, 1981) the AVEs in our study exceeded 0.5.

Table N^0 (02): results of measurement model-convergence validity

Constructs (Cronbach's Alpha)	Items	loading	AVE	CR
durable partnering sub-contraction (0,874)			0,534	0,901
Integration of CSR by contractors (0,779)	Q.J3	0,733	0,603	0,858
	Q.J5	0,796		
	Q.J6	0,748		
	Q.J7	0,826		
Integration of CSR by Subcontractors (0,738)	Q.L4	0,909	0,791	0,883
	Q.L5	0,869		
Integration of CSR by suppliers (0,633)	Q.K1	0,869	0,731	0,845
	Q.K4	0,841		
Diffusion of CSR on SCM (SSCM) (0,902)	Q.N1	0,791	0,720	0,927
	Q.N2	0,927		
	Q.N3	0,883		
	Q.N4	0,785		
	Q.N6	0,847		

Source: prepared by researchers based on Smart PLS 3 outputs**.**

4.2.2 Discriminate validity:

Discriminant validity is the degree to which items differentiate among measure distinct concepts by examining the correlations between the measures of potentially overlapping constructs. In other words, discriminant validity aims to verify that the variance shared between the variable and these indicators (items) exceed the variance shared with the other variables.
According to (Fornell & Larcker, 1981) and (Chin, 2010) the square root of the AVE of each construct must be superior to the correlation with any other construct.

The table N^0 (03) represents the results of the discriminant validity, it shows that the square root values of the AVEs in the diagonals of the matrix are all higher than the non-diagonal elements of the matrix. This led us to find that the correlation of each variable with itself is greater than its association with the rest of the variables in the model; therefore, the discriminant validity is acceptable.

Table N^0 (03): latent variable correlations

	Diffusion of CSR on SCM (SSCM)	Integration of CSR by Subcontractors	Integration of CSR by suppliers	Integration of CSR by contractors
Diffusion of CSR on SCM (SSCM)	**0,848**			
Integration of CSR by Subcontractors	0,633	**0,890**		
Integration of CSR by suppliers	0,528	0,670	**0,855**	
Integration of CSR by contractors	0,651	0,756	0,562	**0,766**

Source: prepared by researcher based on Smart PLS 3 outputs.

4.3 Assessment of structural Model:

After the evaluation of the measurement model, according to (Real, Leal, & Ronaldan, 2006) the second step in the SEM-PLS procedure is the assessment of the structural model by examining the extent to which causal relationships are consistent with available data.

Assessment of structural model consist on different tests:

- **hypotheses test- path coefficient:** To test our hypotheses, we followed the Bootstrapping procedure, with is a non-parametric analysis that allow us to check the significance of the structural links in other words the link variables will allow hypotheses to be validated or not. To do this, we need to examine the direction of the "Path coefficient" causal coefficients as mentioned in the following table:

Table N^0 (04): Path coefficient of the research hypotheses

	original sample	Average	SD Stander deviation	T-value	P-value	Decision
Integration of CSR by suppliers-> Integration of CSR by subcontractors	0.416	0.458	0.080	5.770	0.019	Supported *
Constructive partnership-> diffusion of CSR on SCM	0.694	0.669	0.165	4.210	0.000	Supported **
Constructive partnership-> Integration of CSR by subcontractors	0.566	0.574	0.078	7.261	0.000	Supported **
Constructive partnership-> Integration of CSR by suppliers	0.806	0.781	0.126	6.412	0.000	Supported **

Constructive partnership-> Integration of CSR by contractors	0.916	0.879	0.089	10.261	0.000	Supported **

Significant at p=< 0.01, p*<0.05**

Source: prepared by researcher based on Smart PLS 3 outputs.

5. Discussion:

The purpose of our study is to illustrate the relationship between subcontracting and integration of CSR approach to achieve a sustainable supply chain management by taking into consideration the constructive partnership between suppliers, contractors and subcontractors.

The results of our research confirm the reliability and validity of the conceptual model of this research, and demonstrate that the integration of CSR approach effect positively a partnership inter-firms, therefore this partnership increase the value in sustainable supply chain management.

6. Conclusion:

The globalization of markets, the technical changes, new business strategies such as CSR approach effect the relationship between companies.

Our research has allowed us to determine the existence of a significant relationship between the partnership in subcontracting and supply chain management if the CSR approach is implemented

Companies must continue to adopt sustainable models in order to meet the expectations of stakeholders' and to achieve a sustainable supply chain.

Our research is based on the subcontracting relationship and only the motivation which can conduce firms to adopt the integration of CSR approach. The results are as follows:

There is a significant impact of the integration of CSR approach in inter-company relations and sustainable supply chain management through subcontracting, for that the hypothesis of our study which is;

H: the integration of CSR in inter-company relations increases the creation of value for different partners throughout the supply chain to achieve sustainable supply chain management is valid because our four sub-hypotheses after the research hypotheses test were almost supported

- **Suggestions:**

We suggest the extension of this research:

- To study the impact integration of environmental, social and economic dimensions on the practice of supply chain management,
- Studying the effect of supply chain practices on the inter-companies' relations.
- Studying the importance of sustainability in a supply chain and the

role of incentives for successful sustainability efforts.

- To study the CSR reports for a couple of firms. Identify actions across a few supply chain drivers that have improved sustainability.

6. Bibliography List:

– Baba, V. F., Wang, T., Adzani, S. A., & Abdul-Hamid, Z. (2021). Information Sharing and Supply Chain Collaboration: Strategy for Higher Firm Performance in Ghana. *American Journal of Industrial and Business Management, 11*(6), 635-645. doi:10.4236/ajibm.2021.116041

– Bagozzi, R., & Yi, Y. (1998). On the evaluation of Structural Equation Models. *Journal of the Academy of Marketing Sciences, 16*, 74-94.

– Baudry, B., & Bouvier-Patron, P. (1994). De la sous-traitance traditionnelle à la sous-traitance partenariale: une application de la théorie de l'agence. *Génie industriel: les enjeux economiques*, 227-245.

– Belin-Munier, C. (June, 2010). Du SCM au SCM durable: concepts, pratiques des entreprises et performces telles qu'elles ressortent des études internationales depuis 2004. *XIXème cinférence de l'association internationale de management stratégique* , 25.

– Brodhag, C., & Tahiri, A. (2011). Le management de projet d'ingénierie: vecteur d'innovation par l'intégration d'une démarche RSE pour le développement durable. *https://hal-emse.ccsd.cnrs.fr/emse-00634165*, 01-25.

– Chin, W. (2010). How to write up and report PLS analyses. In W. Chin, V. E. Vinzi, H. Henseler, & H. Wang, *Partial least squares concepts, methods and applications* (pp. 90-655). new-york: Springer.

– Companies, C. F. (1999). *REPORT CODE OF CONDUCT*. MILANO: Borsa Italiana S.p.A. Retrieved from www.borsaitalia.it

– Craig R. Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management, 38*(5), 360-387. doi:DOI 10.1108/09600030810882816

– El aidouni, M., & Abbassi, A. (2012). La RSE dans le management de la chaine logistique. *revue marocaine de recherche en management et marketing N°6-7*.

– Fornell, C., & Larcker, D. (1981). Evaluating Structural Equation Models with unobservable variables and Measurement error. *Journal of Marketing Research, 18*, 39-50.

– Fornell, C., Lorange, P., & Roos, J. (1990). The cooperative venture formation process: A latent variable structural modeling approach. *Management science, 36*(10), 1246-1255.

– Fu, Q., Abdul Rahman, A., Jiang, H. J., & Comite, U. (2014). Sustainable supply chain and business performance : the impact of strategy, network design, information systems, and organizational structure. *sustainability, 14*. doi:doi.org/10.3390/su14031080

– Hair, J., Bill , B., Barry, B., & Rolph, A. (2006). *Multivariate Data Analysis.* Upper Saddle River: Pearson Prentice Hall.

– Hair, J., Hult, G. T., Ringle, C. M., & Sarstedt, M. (2016). *A primer on partial least quares stuctural equation modeling (PLS-SEM)* (2 ed.). Thousand Oaks, CA: Sage publications.

- Harland, C. (2013). Supply chain management : relationships,chains and networks. *British Journal of Managment*, 63-80.
- Hila, C. M., & Dumitrascu, O. (2014). OUTSOURCING WITHIN A SUPPLY CHAIN MANAGEMENT FRAMEWORK. *PROCEEDINGS OF THE 8th INTERNATIONAL MANAGEMENT CONFERENCE*, 328-336.
- Liao, S.-H., & Widowati, R. (2021). A supply chain management Study: A Review of Theoretical Models from 2014 to 2019. *Operations and Supply Chain Management: An International Journal*, 173-188.
- Mabrouk, M., Sperandio, S., & Girard, P. (2012, june). Vers l'intégration de la responsabilité sociétale des entreprises dans leur management-guide methodologique. *9th international conference on modeling, optimization and simulation*.
- Ng, S., & Luu, C. D. (2008). Modeling subcontractor registration decisions throught case-based reasoning approach. *automation in construction*, 873-881.
- Quairel, F., & Auberger, M.-N. (2007). La diffusion de la RSE par la relation fournisseurs : injonctions paradoxales ou partenariat de progres ? *Revue internationale P.M.E. : économie et gestion de la petite et moyenne entreprise, vol. 20, n°3-4,*, 69-94.
- Rahim, M. M., & Wisuttisak, P. (2013). Corporate social responsability-oriented cimpliances and SMEs Access to global market: evidence from bangladesh. *journal of Asia-pacific business*, 58-83.
- Real, J. C., Leal, A., & Ronaldan, J. (2006). iNFORMATION TECHNOLOGY AS A DETERMINANT OF ORGANIZATIONAL LEARNING AND TECHNOLOGICAL DISTINCTIVE COMPETENCIES. *Industrial marketin management, 35*(4), 505-521.
- Sundram, V. K., Chhetri, P., & Bahrin, A. S. (2020). The consequences of information technology, information sharing and supply chain integration, towards supply chain performance and firm performance. *Journal of international logistics and trade, 18*, 15-31. doi:https://doi.org/10.24006/jilt.2020.18.1.015
- Tarigan, Z. J., Jiputra, J. A., & Siagian, H. (2021). The effect of supply chain practices on retailer performance with information technology as moderating variable. *International Journal of Data and Network Science*, 47–54.
- Wolf, J. (2011). Sustainable Supply Chain Management Integration: A Qualitative Analysis of the German Manufacturing industy. *Journal of Business Ethics, 102*, 221-235. doi:https://doi.org/10.1007/s10551-011-0806-0