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Summary: Scholars and practitioners already shown that Big Data and Predictive Analytics (BDPA) can play a pivotal role in transforming and improving the functions of sustainable supply chain analytics (SSCA). However, there is limited knowledge about how BDPA can be best leveraged to grow social, environmental and financial performance simultaneously. Therefore, with the knowledge coming from literature around SSCA, it seems that companies still struggle to implement SSCA practices. Researchers agree that is still a need to understand the techniques, tools, and enablers of the basics SSCA for its adoption; this is even more important to integrate BDPA as a strategic asset across business activities. Hence, this study will investigate, for instance, what are the enablers of SSCA, and what are the tools and techniques of BDPA that enable 3BL of sustainability performance through SCA. For this purpose, we will collect responses from structured remote questionnaires by targeting highly experienced supply chain professionals. Later, we are going to analyze the data using a well-known statistical analysis such as exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and logistics regression.
Keywords: sustainability, supply chain analytics, big data and predictive analytics, enablers
Research Proposal

Introduction

Big Data and Predictive Analytics (BDPA) has become crucial for managing supply chain functions, where intensive data processes can be vastly improved through its effective use. BDPA has emerged as both a strategic and operational tool that may bring fundamental changes to the supply chain (SC) (Wu et al. 2015; Waller & Fawcett 2013; Song et al. 2017; Zhao et al. 2017). Big data and predictive analytics are one of the fastest evolving fields due to the convergence of Internet of Things (IoT), cloud computing, and fast-cycling mobile devices (Downes, Larry; Nunes 2013). As stated by (Fawcett et al. 2011; Assink 2006), advances in information technology enabled the supply chain revolution. Nowadays, data is so easy to collect (e.g., RFID, barcodes, loyalty cards) and so low-cost to stores, that big data analytics is enabling a new source of customer intimacy and competitive advantage.

As a valuable asset for decision-making, BDPA can play a pivotal role in transforming and improving the functions of SC (Davenport 2014; Papadopoulos et al. 2015; Arunachalam et al. 2017; Waller & Fawcett 2013). In this changing business environment, business leaders prefer to take decisions counting in mind the data-driven insights rather than relying on their institutions (Waller and Fawcett 2013; Davenport 2014). Also, BDPA has the capability of transforming the decision making the process by allowing enhanced visibility of firm operations and improved performance measurement mechanism (McAfee and Brynjolfsson 2012). For example, according to (Marr 2016) Walmart, the largest retailers in the world and the world's largest company by revenue, with over two million employees and 20,000 stores in 28 countries, is using BDPA to drive supermarket performances. In 2015, the company announced they were in the process of creating the world's largest private data cloud, to enable the processing of 2.5 petabytes of information every hour. To understand their customer needs and provide them with the products they wanted to buy, Walmart and their

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fast-big Data Team create Data Café. At the Café, the analytics team has been capable of monitoring 200 streams of internal and external data in real time, including a 40-petabyte database of all the sales transaction in the previous weeks. (Marr 2016) also mentioned that timely analysis of real-time data it does seem as key to driving business performances.
Additionally, practitioner and scholars are wondering how BDPA impact the three sustainability aspects (environmental, economic and social) in Supply Chain. BDPA becomes a competitive necessity for the management of supply chains, with practitioners and scholars focused almost entirely on how BDPA is used to increase just the economic measures of performance (Chen et al. 2012). Later, (Wang et al. 2016) brought the term Sustainable Supply Chain Analytics (SSCA) to combine the techniques of BDPA applied into Sustainable Supply Chain. He defined SSCA to the use of methodologies and techniques to collect, analyze, disseminate, and use sustainability-related information for both strategy and operations. However, there is limited understanding of the role of BDPA and SSCA as the 'glue' that enables in building a format needed for taking strategic decisions related to sustainability (Wang et al. 2016; Firouzeh et al. 2017). For these reasons, this issue was chosen for this study. This paper addresses the gap in the identification of dominant enablers to implement SSCA through structured remote questionnaire by targeting highly experienced supply chain professionals. Posterior, we are going to analyze the data (e.g., identification of the leading enabler) using a well-known statistical analysis such as exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and Logistic Regression.

Literature Review

Sustainability and Triple Bottom Line (3BL)

The term "sustainability" is not new as it has been used in the last three decades as an umbrella to address the need to pay attention to environmental and social issues and at the same time achieving economic prosperity. The terminologies of "*sustainability*," and "*3BL*" are used interchangeably in the literature to refer to the three pillars of environment, social and economical. The existence of several terminologies and various definitions for each terminology is confusing and raises the need to have a consensus on concrete terminology and definition (Andersen and Skjoett-Larsen 2009). The following subsections provide definitions and discussions to the two terminologies to clarify if there are differences between them.

- Triple Bottom Line (3BL)

3BL is a concept originated at the beginning of the 1990s and used extensively by large corporations as a tool to address not only financial performance but also their environmental and social performances (Hacking and Guthrie 2008). (John Elkington 1997) defined 3BL as "the principle of ensuring that our actions today do not limit the range of economic, social and environmental options open to future generations." Accordingly, the 3BL concept is developed to consider the intersection and balance of the three dimensions: environment, social and economical at a microeconomic level. The aim is to realize environmental and social performances improvement and at the same time achieve long-term economic benefits and competitive advantages (Prahalad and Rangaswami 2009). Therefore, the assumption for 3BL is based on the company performing well on all the three dimensions and reporting on its performance. 3BL reporting is used to define "company's ultimate worth in financial, social and environmental terms" (Norman and Macdonald 2004). However, 3BL is criticized for being more of an accounting tool and overlooking the perspective of the supply chain when considering the three dimensions (Pagell and Wu 2009).

- Sustainability

Sustainability holds several meanings and interpretations. The sustainability word can be understood as the capacity to maintain or to endure and adapt (Starik and Kanashiro 2013). Sustainability is a relatively new research topic, and it has gained momentum and wide consideration from public and private sectors during the last decade. Most of the research refers to Brundtland Report (World Comission on Environment and Development 1987) as the reference point and allege for the wide consideration of sustainability especially from the industry. The report and its most quoted definition have induced wide reflections on sustainability applicability regarding the scope (environment, economic and social) and scale (local, national or international). Nonetheless, the sustainability definition provided in the report has been criticized for being generic and provides little guidance for companies on how to link sustainability to their activities. This comes from the fact that the Brundtland report aims for a global level implementation making the applicability of the definition at a micro scale irrational (Carter & Rogers 2008; Jennings & Zandbergen 1995; Bartlett et al. 2007). Most importantly, the definition poses a question on how to operationalize sustainability in companies activities and supply chains (Linton et al. 2007; Hutchins & Sutherland 2008; Vachon & Mao 2008).

This study will investigate, what are the enablers of SSCA, and what are the tools and techniques of BDPA that enable **social, economic and environmental** performances through SCA. For this reason, we chose to work in this paper with the concept "3BL" that considers the intersection and balance of the three dimensions of sustainability.

What is Big Data and Predictive Analytics?

As part of this analysis, this study explores emerging technologies that is driving major innovation and represent potential changes in the sustainable supply chain analytics design. This technology is big data and predictive analytics (BDPA). There is no clear consensus on different terminologies related to big data in the literature. However, there is a pattern of evolution regarding the definitions and development of capabilities from different perspectives and authors as you will see in Table 1 below:

Table 1: Big Data definitions and perspectives

Authors	Definitions	Focus
(Fosso Wamba et al. 2015; Gunasekaran et al. 2017)	"a holistic approach to manage, process and analyze data regarding high volume, variety, velocity, veracity, and value to create actionable insights for sustained value, delivery, measuring performance and establishing competitive advantages."	Informatics perspectives
(Beyer & Laney 2012)	"High-volume, velocity and variety information assets that demand cost-effective, innovative forms of information processing for enhanced insight and decision making."	Informatics perspectives
(Brown et al. 2011)	"Big data refers to datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze."	Informatics perspectives
(Hurwitz et al. 2013)	''The capability to manage and analyze petabytes of data enables companies to deal with clusters of information that could have an impact on the business".	Capabilities perspectives
(Wang et al. 2015)	''The ability to acquire, store, process and analyze a large amount of health data in various forms, and deliver meaningful	information lifecycle management

	information to users that allow them to discover business values and insights in a timely fashion".	
(Hofmann 2017)	"The ability of the organizations to process the volume of data integrated from a variety of data sources at a high velocity."	Capabilities perspectives
(Richey et al. 2016a)	''The ability of organizations to collect and organize supply chain data from heterogeneous systems distributed across organizational boundaries, analyze it either batch-wise or real-time or near real-time and visualize it intuitively to create proactive supply chain system and support decision making".	Supply Chain Perspectives

Based on the nature of data, Big Data (BD) was characterized mainly by three dimensions (3V's) 'Volume,' 'Velocity' and 'Variety' (IBM 2015; Brown et al. 2011; Sonka 2014; Gunasekaran et al. 2016). But, apart from the 3V's BD can also be characterized by another two dimensions 'Veracity' and 'Value' as given in Table 2 below:

Table 2: The 5V's of Big Data

Dimensions	Indicator/Units	Descriptions	Authors
Volume	GBytes or Tbytes	Volume refers to the magnitude of data generated. Big data implies enormous volumes of data. It used to be employees created data. Now that data is generated by machines, networks and human interaction on systems like social media the volume of data to be analyzed is massive.	(IBM 2015; Brown et al. 2011; Sonka 2014; Wamba et al. 2017; Fosso Wamba et al. 2015; Davenport et al. 2006)
Veracity	% of data declared "outlier," deviation from mean, % of missing values	Veracity refers to ensuring data quality, verifying unreliable and uncertain data. Is the data that is being stored, and mined meaningful to the problem being analyzed	(IBM 2015; Mishra et al. 2016; Brown et al. 2011; Neaga et al. 2015; Ge & Jackson 2014; Davenport et al. 2006)
Velocity	GBytes per second or minute or delta T	Velocity refers to the speed at which data is generated. It deals with the pace at which data flows in from sources like business processes, machines, networks and human interaction with things like social media sites, mobile devices, etc. The flow of data is massive and continuous.	(IBM 2015; Brown et al. 2011; Sonka 2014; Wamba et al. 2017; Fosso Wamba et al. 2015; Davenport et al. 2006)
Variety	# of variables, # of sources, # of formats	Variety refers to "structural heterogeneity in a dataset." Strictly speaking, in the many sources and types of data, both structured and unstructured. We used to store data from sources like spreadsheets and databases. Now data comes in the form of emails, photos, videos, monitoring devices, PDFs, audio, etc. This variety of unstructured data creates problems for storage, mining and analyzing data.	(IBM 2015; Brown et al. 2011; Sonka 2014; Wamba et al. 2017; Fosso Wamba et al. 2015; Davenport et al. 2006)
Value	ROI	The extent to which big data generates economically worthy insights and or benefits through extraction and	(IBM 2015; Mishra et al. 2016; Brown et al. 2011; Neaga et al. 2015; Ge & Jackson 2014;

		transformation.	Shacklett 2017)

What can you do with big data and predictive analytics (BDPA)?

According to McKinsey and Company, big data and predictive analytics (BDPA) would be an opportunity to knuckle down some challenges that industry is facing. For example, improve customer experience, making sense of large amounts of unused business data, improve inaccurate or misleading revenue forecast and models, focus on micro decisions, etc. (Court 2015). This consultancy firm found that collecting, storing, and mining BDPA for insights can create significant value for the world economy, enhancing the productivity and competitiveness of companies and the public sector and creating a substantial economic surplus for consumers (Manyika et al. 2013; Brown et al. 2011). Due to the perceived benefits of BDPA, organizations are highly motivated to develop their technical and organizational capabilities to extract value from data. The core aspects of generating value depend on organization's ability to capture, store and analyze a large volume of complex data generated in real or near real-time with the support of advanced analytics (Yesudas et al. 2014). Further, recent studies show that supply chains are gathering huge amounts of data but companies and practitioners are facing extreme difficulties in understanding the required capabilities to transform data into value (Lisa & Toby 2017; Rogers Dale 2017; Richey et al. 2016b). For example, a survey was conducted in June 2017 via an e-mail invitation to readers of CSCMP's Supply Chain Quarterly and subscribers to a newsletter produced by Competitive Insights. According to (Rogers Dale 2017), from Arizona State University, explaining his findings regarding the knowledge of practitioners in big data, he said:

"We found a lot of confusion, there's not a unified understanding of the concept, and there's not a clear direction of how you should go. What most companies are doing is they are managing big data analysis with Excel spreadsheets."

Also, some researchers mentioned that big data and predictive analytics could improve the ability to help sourcing decisions, and reduce environmental footprint (Mark van Rijmenam 2014; Fawcett & Waller 2014). Indeed, there are some authors, that are saying that it is time to move forward in how BDPA can be used to enhance operational and economic-based supply chain outcomes. So, we should examine how BDPA can increase measures of the other two 3BL aspects of the supply chain that are becoming increasingly important in today's global marketplace (Benjamin T Hazen et al. 2016).

Sustainable Supply Chain Management (SSCM)

There is a growing need for integrating sustainability sound choices into supply-chain management. There are early links that were fueled by the desire to optimize economic performance, indicating the introduction of the environmental aspect even in the initial stages of SCM. The idea grew into green supply chain management (GSCM) (Sarkis 2003) and culminated in sustainable supply chain management (SSCM) (Seuring & Muller 2008). There's a comprehensive literature review on SSCM by (Craig & Dale 2008; Seuring & Muller 2008) that contains 191 papers in English, peer-reviewed journals between the years 1997 and 2007 showing a considerable number of publications for the later years. This number has risen to > 300 in the year 2011 (Seuring 2013; Beske & Seuring 2014) showing that SSCM is currently a thriving field of academic research. At this point, we are going to

skip repeating definitions of SCM that can be found in some contributions already made by (Mentzer et al. 2001). In supply chain management literature, the inclusion of sustainability is most often base on the triple bottom line (3BL) approach which calls for equal consideration of all three pillars of sustainability, namely, economy, ecology, and society. (J. Elkington 1997; Seuring & Muller 2008; Seuring et al. 2008) define SSCM: "As the management of material, information and capital flow, as well as cooperation among companies along the supply chain, while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social into account which are derived from customer and stakeholder requirements." As mentioned before, to meet the requirement of sustainability practices in the supply chain, a company must be able to comply with the 3BL.

Sustainable Supply Chain Analytics (SSCA)

Sustainable Supply Chain Analytics (SSCA) is described as the use of business analytics in the collection, analysis, and circulation of sustainability-related data. The objective is to line the opportune information that can be used for effective and efficient decision-making on sustainability issues (Deloitte 2013). The literature has high pointed the need by organizations to manage and collaborate closely with suppliers and customers on sustainability concerns (Leppelt et al. 2013) to accomplish better control of risks and organizational sustainability (Foerstl et al. 2010; Paulraj 2011). For this purpose, Supply Chain Analytics (SCA) can gather and analyze sustainability-related data efficiently and effectively, thus supporting a variety of informational needs that include forecasting, analysis, and evaluation of economic, environmental, and social issues. Organizations need to develop and acquire capabilities to enable SSCA. Therefore, we do recognize that sustainable SCA requires broader thinking and alignment between strategic goals and big data analytics as well as supportive organizational culture (Richardson 2011; Ransbotham 2017; Wang et al. 2016). Scholars have enhanced the role of organizational culture (Ageron, Blandine; Lavastre, Olivier; Spalanzani 2013; Mello & Stank 2005; Gunasekaran & Spalanzani 2012) have enhanced the relationship between strategic goals, culture, transparency, and risk management as the building blocks of SSCA. To enable this relationship, BDPA and SSCA come to the foreground to secure the collection, cleansing, analysis, and distribution of information seamlessly across functions and processes (IBM 2018). It is important that leaders understand the role of SSCA as the 'glue' that enables to build the format needed for taking strategic decisions related to sustainability. This will enable leaders to acquire the appropriate analytical capabilities as well as the appropriate resources needed on adopting SSCA to create organizational value through the fulfillment of the organizational goals (Bertels 2010; Deloitte 2012). Top and senior management commitment is a priority for those organizations and supply chains that are embracing sustainable practices (Foerstl et al. 2015; Gattiker & Carter 2010). Researchers have already identified several drivers and barriers to successful implementation of SSCA. However, there is no research completed that seeks to identify the influence degree of each factor for facilitating/delaying sustainability adoption. This paper aims to follow the advice of other scholars in to estimate the impact factor of enablers/disruptions using big data and predictive analytics on SSCA (Wang et al. 2016; Firouzeh et al. 2017).

Enablers for SSCA

The ***enablers*** of SSCA (Walker et al. 2008; Lin et al. 2010)***:*** are the factors that motivate the adoption of sustainable supply chain analytics. These enablers are described for any innovation explained before as well as for SSCA, and for this reason, they have been included

in the conceptual framework. The present study focuses on analyzing the enablers for SSCA adoption from environmental, economic, and social perspectives. We sought a fit for sustainable adoption of the traditional supply chain by using the terms "sustainable supply chain management; enablers for green supply chain and supply chain innovation." The identified enablers are shown in Table 3 and Table 4 respectively. We have to point out that in the original papers were 25 enablers and focused on green supply chain. On the other hand, for our study, we are using the eleven (11) significant for us. These enablers are divided into two groups external/internal, as you'll see below.

- **Internal Enablers**

A requisite for a fruitful implementation of SSCA standards is the compliance of the company's employees. Scholars frequently are mentioning the commitment of the top management, but also their involvement and specific support as being beneficial (Oelze 2017). In the same manner, an overall supportive culture for sustainability, the existence of an environmental mission and the history of an organization are acknowledged enablers for SSCA. These include the involvement of employees. Additionally, state of the art brought us strategic aspects. Thus, the existence of a sustainability strategy for supply chain analytics and its alignment with the overall corporate strategy has been identified as crucial (Dey et al. 2011; Hervani et al. 2005). The basic strategic planning of the implementation of SSC policies has already been recognized as conducive to their successful implementation (Klimley 2007). Further, strategic supplier collaboration has been defined as the "collaborative paradigm" that is essential to achieve a competitive advantage through sustainable supply chain analytics (Firouzeh et al. 2017; Mani et al. 2017; Wang et al. 2016). Furthermore, previous research enhances the resources and expertise of companies in the context of enablers for SSC. More specifically, the availability of resources and the overall size of a company constitute enablers for SSC since they determine the possible sustainability effort of a firm (Alvarez et al. 2010). Besides, the existence or development of capabilities related to sustainability and general supply chain are highlighted in the academic literature (Large & Gimenez Thomsen 2011). In particular, this relates to the training of people within the purchasing department (Andersen & Skjoett-Larsen 2009). Moreover, prior studies suggest evidence for well performing operational metrics as an enabler for SSC (Sikdar 2003; Clift 2003).

Table 3: Internal Enablers for the Sustainable Supply Chain Analytics adoption (Walker et al. 2008; Lin et al. 2010; Oelze 2017; Diabat et al. 2014)

No.	Internal Enablers: Top management related	Research methodology
1	Skillful policy entrepreneurs	Qualitative/Interview
2	Values of owner	Case study/participation
3	Employee involvement	Survey/questionnaire
4	Desire to reduce costs	Case study/interviews
5	Investor pressure	Case study
6	Improve quality	Survey/questionnaire

- **External drivers**

External enablers are firmly related to the global context in which a firm works. On this point, the national culture of a supplier can constitute an enabling factor for SSCA (Ciliberti et al. 2010a). Moreover, a technological and logistical integration of supply chain members and information sharing are conducive to successful implementation (Vachon & Klassen 2006a; Zsidisin & Hendrick 1998). According to this can also reduce the need for audits through an enhanced understanding of suppliers' processes (Barratt 2004). However, SSCA is only supported when the relationship between the focal firm and its supply chain members is characterized by trust and transparency (Oelze et al. 2016; Ciliberti et al. 2010b). In this respect, long-term collaborative structures within but also outside the supply chain support SSCA. This applies in particular to collaboration within a sector with NGOs or with competitors (Pagell & Wu 2009; Oelze et al. 2016; Vachon & Klassen 2006b).

Table 4: External Enablers for the Sustainable Supply Chain Analytics adoption with references.

No.	Related to:	External Enablers	Author	Research Methodology
1	Competition	Improve firm SSCA performances	(Carter & Rogers 2008; Carter et al. 2007)	Survey/questionnaire
2	Regulatory (e.g., ISO 14000 certification)	Adoption of health and safety standards	(Carter & Rogers 2008; Carter et al. 2007)	Survey/questionnaire
3	Society/Public pressures	Adoption of green practices	(Govindan 2013; Zhu et al. 2012; Nishat Faisal 2010)	Case study/interviews
4	Customers demand	Customer satisfaction	(Hendricks & Singhal 2005; Hussain 2011)	x
5	Customers demand	Improvement of product characteristics	(Hussain 2011)	

Theoretical grounding

- **Absorptive Capacity View (ACV)**

In this study, we follow the absorptive capacity view (ACV) as a Dynamic Capability (DC) that in organizations can play a significant role in both assimilation and extraction of value from BDPA. Dynamic Capabilities (DCs) was defined by Teece as: "the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al. 1997). On the other hand, Absorptive Capacity (AC) is "the ability of a firm to recognize the value of new, external information, assimilate it, and apply it to commercial ends is critical to its innovative capabilities (Cohen & Levinthal 1990)." (Malhotra, A., Gosain, S., & Sawy 2005) perceive it as "the set of organizational routines and processes by which organizations acquire, assimilate, transform, and exploit knowledge to produce dynamic organizational capabilities." Furthermore, in the context of

technology assimilation, AC is treated as an asset in the form of prior knowledge possessed by organizations which foster innovation (Roberts et al. 2012). BDPA as a knowledge infrastructure could enhance knowledge transfer from supply chain partners and increase recipient firm's AC. Further, in relevance to extracting value from technology like BDPA, AC can be conceptualized as a DC, which could complement BDPA capability in generating business value. Additionally, AC is used by many researchers to explain organizational learning from a strategic management perspective. AC is a multi-level and multi-dimensional construct. It relates to the individual level to inter-organizational level and can have many interrelated capabilities (Roberts et al. 2012; Wang et al. 2014). In supply chain context, the critical information needed to improve supply chain performance is mostly available in external sources (Dobrzykowski et al. 2015), not readily accessible for decision-making. Nevertheless, BDPA can provide that critical information in real-time and enhance the organizational capability to acquire, assimilate, transform, and exploit the information and knowledge for commercial ends. Moreover, firms with low absorptive capacity (AC) would find it difficult to adopt innovative BDPA technologies such as MapReduce (Ebner et al. 2014). Likewise, it can be argued that even if BDPA resources are well established at the organization level, it becomes obsolete when an organization does not exhibit absorptive capacity. In fact, AC is considered as one of the prerequisites of BDPA initiatives or successful implementation (Kabir & Carayannis 2013; Wang et al. 2015; Wamba et al. 2017; Arunachalam et al. 2017). However, the DC view has failed to examine the social context within which selection of the resources are embedded (Dubey, Gunasekaran, Childe, et al. 2017). (Dubey, Gunasekaran, Childe, et al. 2017) tried to address this limitation introducing organizational culture (OC). However, they argue that the institutional pressures may offer a better explanation to explain the motivation of the organizations which seek beyond economic rationality. Thence, they advise that we should do future research that can examine the adoption of BDPA on SSCA using integration of institutional theory and DCs (Dubey, Gunasekaran, Childe, et al. 2017; Benjamin T. Hazen et al. 2016).

- **Institutional Theory**

According to (Benjamin T. Hazen et al. 2016), Institutional Theory seeks to explain how an organization's external environment impacts the organization's structures and processes. He mentioned that institutions could be defined by a set of rules within an environment that form a pattern of acceptable behavior among those operating within that environment. He thinks that organizations that become part of the institution conform to the behaviors of the institution and are difficult to change. The adoption of organizational practices typically occurs via **coercive** (exerted by those in power), **normative** (exerted by social influences), or **mimetic** (exerted to imitate success) influences on the organization (DiMaggio & Powell 1983). The institutional theory may be particularly useful within a supply chain context. As an institution, the supply chain induces partners to take on behaviors that individually the organization may not have chosen as a rational choice (Daudi et al. 2016). Applications across all three aspects of the 3BL apply. Coercive pressures have been found crucial in the adoption of environmentally sustainable practices (Zhu et al. 2007; Sarkis et al. 2011). Similarly, normative inducement examples can be found in the formation of social organizations such as

industry groups and professional societies (Zsidisin et al. 2005; Zsidisin et al. 2008). Finally, the mimetic force examples can be seen in the adoption of supply chain practices that an organization perceives to be successful, profitable, or cost-effective (Ketchen & Hult 2007).

Research Gap and Research Questions

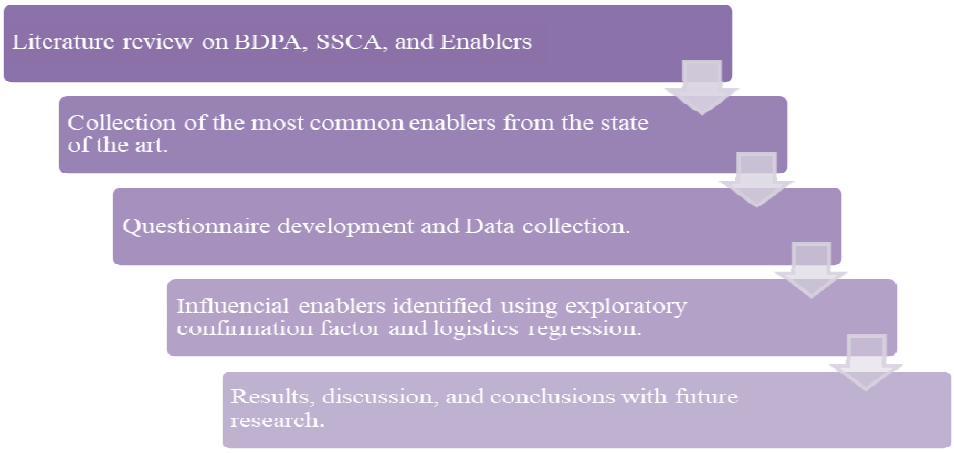
BDPA has the capability of transforming the decision-making process by allowing enhanced visibility of firm operations and improved performance measurement mechanism. Additionally, practitioner and scholars are wondering how BDPA impact the 3BL in SCA. However, it is limited understanding the important role of BDPA and SSCA as the 'cement' that enables the format needed for taking strategic decisions related to sustainability (Wang et al. 2016; Firouzeh et al. 2017). BDPA, become a competitive necessity for the management of supply chains, with practitioners and scholars focused almost entirely on how BDPA is used to increase just the economic measures of performance. Some authors already tried to address this limitation.They introduce organizational culture (OC) to study the environmental and social aspects that were missing in the literature using Dynamic Capabilities (DCs) (Dubey, Gunasekaran, Childe, et al. 2017). However, DCs failed by itself, and the authors argued that the institutional pressures may offer a better explanation to explain the motivation of the organizations which seek beyond economic rationality. Thence, he advises to make future research on examining the adoption of BDPA on SSCA using integration of institutional theory and DCs (Dubey, Gunasekaran, Papadopoulos, et al. 2017). Therefore, this paper aims to more closely examine the enablers of the adoption of BDPA on SSCA using integration of institutional theory and ACV as DC by examining the following questions:

1. What are the tools and techniques of BDPA that enable sustainability performance through SCA?
2. What are the enablers of SSCA?
3. How do internal practices compete with external pressures in the adoption of BDPA for SSCA policies and practices?

Methodology

The steps of the solution methodology followed in this study are shown in Figure 1:

Figure 1: Flowchart of the study.



Sample Design and Data Collection

To understand our enablers, we will carry out a questionnaire that was developed based on the literature review. We will send it via email since on-site visits are not possible. We are expecting to send the questionnaire to a total of 200 enterprises, and get approximately 60 valid answers to reach our study. The sample that we want to design will get the information from participants that work in logistics companies. Two criteria will select the participants. First, the firms chosen for the investigation exceeded the criterion of annual sales of U.S. $100 million have at least 100 employees and have operated for over five years. Second, a preliminary informant for each company that engages in the areas of supply chains will be identified, either on the company's website information or through e-mail correspondence. Target participants will be senior executives able to identify the problem of the supply chain to which their firms belong, and who are responsible for SCM and thus were qualified to provide a valid response to our research. All of them will be asked to complete and return the questionnaire form with scales measuring the enablers of implementation of sustainable supply chain analytics.

Data Analysis

This study will use Exploratory Factor Analysis (EFA) technique to identify the dominant enablers for Sustainable Supply Chain Analytics (SSCA). EFA is a technique within factor analysis whose overarching goal is to identify the underlying relationships between measured variables (Norris & Lecavalier 2010). It is commonly used by researchers when developing a scale and serves to identify a set of latent constructs underlying a battery of measured variables (Fabrigar et al. 1999). We propose an EFA to assess the level of importance of each enabler dimensionality of the 11 enablers showing in Table 3 and Table 4 for assessing the SSCA practice adoption. Later, to evaluate the validity of the enablers of this empirical investigation, a confirmatory factor analysis (CFA) will carry out. The objective of confirmatory factor analysis is to test whether measures of a construct are consistent with our understanding of the nature of that construct (Kline 2011). After validating the level of importance, we wanted to perform a Logistic Regression to predict the probability of adoption or failure of SSCA practices (Strano & Colosimo 2006; Palei & Das 2009).

Conclusions

Sustainable development has grown to be a generally used term that goes beyond uncomplicated economic security to include issues of environmental impact and resource use, together, with social effects. Moving towards sustainability in the supply chain analytics requires more motivation (enablers) for SSCA adoption to improve their environmental and social performances. Customers also are expecting environmental friendliness than traditional operations (Diabat et al. 2014). To our best of knowledge, this is the first theory focused approach to explain the enablers of adoption on SSCA. From this study, we want to observe that organizations have notable sustainability awareness and also are interested in retaining their customers by improving their 3BL performances (adopting SSCA practices). Identifying leading enablers for SSCA creates considerable challenges for researchers and industrial experts.

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