

Collaborative Performance and Swift Trust in Tourism Industry of Thailand: Role of Big Data Analytics Capability and External Supply Chain Management

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Abstract— Building trust among different stakeholders of the business and collaborative performance are two most desired organizational outcomes. Such across the board relations largely based on big data exists about these relationships which help to sort out the conflicts. Through the very same big data, manufacturing industry can also look after its external supply chain management practices too. This study has checked the impact of Big Data Analytics Capability (BDAC) on swift trust and collaborative performance in Thailand's manufacturing sector. Moreover, study has also analyzed the mediating role of external supply chain management in relationship between BDAC and swift trust and BDAC and collaborative performance. Data has been collected from managerial level employees of 39 manufacturing firms of Thailand equipped with big data capability. Questionnaire based data was then analyzed through SPSS and AMOS. BDAC was reflected as a significant predictor of swift trust and collaborative performance in results. Indirect role of external supply chain management was also flagged significant in results. This study is novel due to inclusion of external supply chain management as mediator and it will have its implications for manufacturing sector which can improve their collaborative performance through BDAC driven supply chain management.

Key Words: Big Data Analytics Capability, External Supply Chain Management, Swift Trust and Collaborative Performance

1. Introduction

Trust can be defined as the expectation that the advice or words said by someone are reliable or the expectation that the other person will not betray ever [1]. Trust has huge importance in any organization and it grows gradually in any organization [32]. This is also significant when people are working in collaboration with each other in the supply chain of any organization [33]. Traditionally, trust takes time to be developed among individuals but now a new term is introduced called as swift trust [2]. As in tourism industry of Thailand, people involvement is for very short period of time, so it is necessary that the trust is built between the costumers and organization as quickly as possible [34]. This is necessary to provide better services to the costumers. Distrustful conditions are not much in favor of tourism industry [3].

Collaborative performance refers to the performance of all the people that work with each other in a particular supply chain from suppliers to costumers. In tourism industry, many people are working with each other to provide tourism services to the costumers [4]. These people may include transporters, lodging facility providers, tourist guides, hotel and restaurant runners etc. They all work in collaboration with one another for the improvement of tourism industry and sustainability of tourism [1]. The performance of all these people gives the net result which is called collaborative performance. This is important because if any of these actors of tourism

industry do not perform as required, the other actors will be disturbed too which will create in the whole service providing system [5].

External supply chain involves all the operations that are taking place outside the organization [6]. These may include transportation, environmental factors etc. which affect the organization in one way or the

other. External supply chain management in tourism industry involves the provision of tourism services to the customers at lower cost with high profits, but with high levels of customer satisfaction [7]. This can only be possible if all the actors of the supply chain work with each other with aim of serving and improving the performance of tourism industry.



Figure 1: Big Data Analytics Capability

Figure 1 shows the benefits derived from big data analytics capability to increase swift trust and collaborative performance. Big data analytics capability is emerging as a new concept of processing an organization's data and information in a more professional and careful way [8]. 5V structure can be used to evaluate the big data which means volume, velocity, variety, veracity and value describe the big data well. Big data is very beneficial in decision making process because effective decision making is always in favor of the organization [9]. In addition it also helps the organizations having better knowledge about the factors of its supply chain i.e. suppliers, customers, distributors etc. big data is very beneficial in increasing effectiveness and efficiency of an organization by reducing costs and increasing profits. There are several benefits of big data which include transformational, transactional, informational and strategic benefits [10]. Transactional benefits involve the increase in efficiency by reducing communication costs, transformational benefits involve the shift of businesses to new technologies, informational benefits include the proper and careful handling of sensitive data and strategic benefits involve the

improvement in the policies and approaches of an organization [11].

Use of big data analysis in an organization increases the swift trust and collaborative performance of the employees with the improvement in external supply chain management [12]. This is of much importance in tourism industry because it increases the growth and productivity of the industry. In Thailand, unfortunately, the big data analysis is not fully introduced in organizations due to which the external supply chain suffers and lack of trust and poor collaborative performance occurs [13]. In addition to the tourism sector of Thailand, other developing and under developed countries are also facing serious issues regarding trust and performance. If this problem prevails for a longer period, which is not a positive sign for the tourism industry [14]. So this problem needs serious attention and adoption of big data analysis technique in tourism industry to increase trust levels and collaborative performance. Many studies have been conducted in the tourism industry of Thailand and there are fewer studies that show the impact of big data analysis capability on trust level and collaborative performance but no

research has been done to study the mediating role of external supply chain management between the above two variables [15]. A research paper has recommended the study of mediating role of external supply chain management in this regard [16]. The basic objectives of this study are listed below:

- Analyze the significant impact of big data analysis capability on swift trust in tourism industry of Thailand
- Analyze the significant impact of big data analysis capability on collaborative performance in tourism industry of Thailand
- Analyze the significant mediating role of external supply chain management between big data analysis capability and swift trust in tourism industry of Thailand
- Analyze the significant mediating role of external supply chain management between big data analysis capability and collaborative performance in tourism industry of Thailand

Tourism has great importance in Thailand which can be known by the fact that 9% to 17.7% of Thailand's total GDP is because of tourism industry. The real contribution of tourism industry in GDP is much lower than the given data because it is not calculated based on its net revenue; instead it is calculated on the basis of value added. When we talk about the significance, theoretically, there have been many researches and studies conducted in this regard [17; 35]. The practical exposure of these studies is in such a way that these studies enable the tourism industry of Thailand to adopt big data analytics capability to improve trust levels and collaborative performance. The govt. of Thailand is also proving them enough support for this cause [18].

2. Literature Review

2.1 Standard Model Effective Field Theory

Studies [19] believe that theoretical framework of collaborative performances (CP) depends on two simple factors: 1) Collaborative logistics and 2) Horizontal or Vertical Collaborative perspectives. It further explains the role of horizontal collaborative measures which defines the coherent assets that are to be shared in an organization to achieve specific major goals. Collaborative evolutionary path examines the partnership development within the environment of

business and its organization. Collaborative performance (CP) on various aspects of business processing and performance depends on the human collaborative decision-making while, focusing on the cognitive processing related to market orientation. Cognitive developing model or Macro cognition somehow explains the function and principles of collaborative performance within an organizational framework of processes and capabilities. Cognitive principles give rise to the Standard Model Effective Field Theory (SMEFT) [20] along with Organizational information Processing Theory [21] which allows the impact of global constraints to be further determined by the collaborative performance in the field of effective parameters. This theory correlates the variables like big data analytics (BDAC) and external supply chain management SCM with CP along with the functional operation of swift trust. Collaborations and performances of markets and organization depend on the functions of manufacturing sector, productivity of goods and advancement of services. There are many available literature studies that draw a link between growing CP and operation of public administration. But due to its finding and future hypothesis researchers can perceive that there is a positive link between collaboration [22], performance, supply chains and management capabilities. Supply chain collaboration plays a major role in defining the term collaboration along with its performance in a business sector. CP considers a new theory based on supply chain collaboration that is designed to support the effect of big data analytics in the field of collaboration and performance that can handle both internal and external supply chain management that includes humanitarian supply chain as well as technology-enabled supply chain [23]. There can possibly be more holistic approaches which can further define the operation of CP with the help of these two relevant theories, which will highly contribute to the field of management and business capabilities tremendously.

1. Big Data Analysts Capability Relationship with Swift Trust

Past studies [24] analyze the impact of big data analytic capabilities BDAC on an organizational culture which will further enhance the value of swift trust (ST) in the field of tourism, however Swift trust also enhance the culture related to military, civil and disaster management organizations. The framework

related to SWEF theory and Organizational information processing theory OIPS theory conceptually explains the influence of organizational culture on the affectivity and performance of BDAC and Swift trust. In this study data was gathered by different members of the management team, collaborators', contractors, and service providers to have a clear idea about the efficiency of these members of an organization, in benefitting BDAC [11] and Swift trust. Swift trust is an important part of any tourism industry; therefore with the help of analytic capabilities more advancement in their mutual relationship can be seen. Theories present important implications, first, that BDAC has a positive, significant effect on swift trust which is comparatively more than the control orientation and flexible orientation. Moreover these two orientations negatively influence the development rate of Swift trust in a tourism organization. Certain control variables which also shows it impact on BDAC and ST. proves that interdependency and temporal orientation develops a positive and significant effect on ST. This relationship of BDAC and ST creates a better understanding of the information processing capabilities within the organization of tourism. Thus, the following hypothesis is proposed:

H1: Big data analytic compatibility has a significant impact on Swift trust.

2. Big Data Analysts Capability Relationship with Collaborative Performance

Ref [25] suggest the empirical evidences regarding the application of OIS theory that explains the link between BDAC and Collaborative performance (CP), with the intervention of interdependency and temporal orientation that promotes the analytic capabilities along with the performance of collaboration in the field of tourism. However, evaluation of technology and new approaches are regularly emerging to provide new opportunities for the management system of various organizations. New opportunities are created by the influence of big data analytic capabilities which positively influence the function and performances of collaborative measures. Due to development of technology there is frequent demand for big data collaboration because companies can depend on the big data to exploit new opportunities and gain competitive advantages and

also gain deep understanding of hidden values. Many industries around the world are increasing the rate of their dependability, over their potentialities and performances, to generate more revenues. Big data analytics promotes the value of revenues which further enhances the promotion of collaborative performance. According to analysts big data analytic capabilities give rise to the growth of International Data Corporation which enables the big data and CP [26] to increase the revenue growth from nearly \$122 billion in 2015 to more than \$187 in 2019. Big data can be obtained from inside or outside of the companies which will possibly be in two forms, structured data or unstructured data. Many businesses collect more data than their actual requirements to increase the revenue growth by 50%. Furthermore, companies should understand and clearly evaluate their requirement of big data; otherwise they should focus on the required need for developing skills and introduction of the new management style to turn all this information and data into competitive advantage by making progress in the field of CP. Thus, the following hypothesis is proposed:

H2: BDAC has a significant impact on collaborative performance.

3. Mediating Role of External Supply Chain Management between Big Data Analysis and Swift Trust

According to researchers [17] who presents a framework that is related to the functioning of different variables like external supply chain management ESCM including the role of BDAC and Swift trust in tourism sector. Framework was based on the theoretical nature of OIS theory that further elaborates the mediator role of ESCM between BDAC and ST. However, in order to achieve the goals of sustainability and managerial performances, use of ESCM within the business processing environment is necessary. ESCM involves itself in dealing with enormous quantity of data that has been utilized by BDAC in the field of developing data complexities. Management teams need to be professional enough to handle the extra big data; therefore they should not underestimate the positive and negative issues that need to be taken into account before the exploitation of the legal data. Authorities need to have check on management and its managers to make reliable use of big data that should be further analyzed as per its capabilities. If BDAC is analyzed

thoroughly, than it will be easy for the management to focus on the external supply chain, as well as on its performance to increase the value of swift trust [13] within an organization. Nevertheless, because of strong swift trust managers can prepare themselves for further investment, similarly they can derive possible value from big data. Thus, the following hypothesis is proposed:

H3: ESCM has a significant mediating role between the relationship of BDAC and Swift trust.

4. Mediating role of External Supply Chain Management between Big Data Analysis and Collaborative Performance

According to literature of various studies [27], which explain that till now literatures of studies has provided very little empirical evidence on the relativity of a mediating role of ESCM between the performance of BDAC and CP. But somehow, OIS theory develops a connection of the mediating agent with the two particular variables that further elaborates its significant effect on BDAC and CP. Big data analytics can only be studied and investigated with the help of empirical and

conceptual studies. These studies [28] will clearly explains the advantages, benefits and threats related to big data analysis at a company level, where managers have to identify, manage, and control the exploitation of big data which will further derive the value of the investment obtained from the big data technologies. Big data technology functions with the influence of collaborative performance of ESCM. This aim of increasing the investment level and generating higher level of revenues, only depend upon the value of supply chain management and CP at an organizational level. Academic and managerial sectors of any company or organization are always based on the interest of big data capabilities that further enhances the value of BDAC along with the management of big data. Big data technologies highlight the aspects of positive impact of external supply chain performance and management on CP and BDAC collectively. Thus, the following hypothesis is proposed:

H4: ESCM has a significant mediating role between the relationship of BDAC and Collaborative performance.

Model:

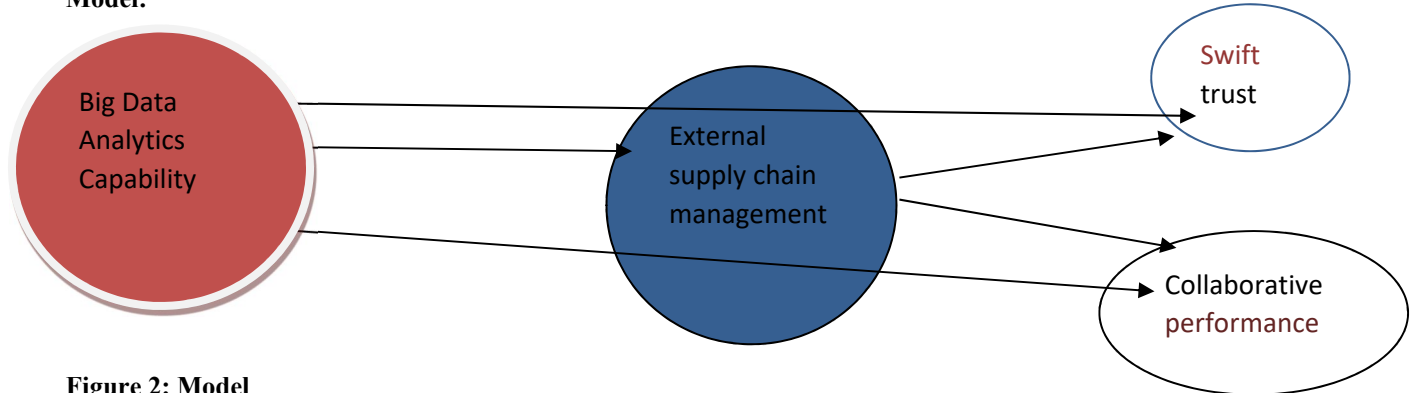


Figure 2: Model

3. Research methodology

3.1. Population and Sampling

In this research study, researcher examined how the role of big data analytics capability and external supply chain resulted in collaborative performance and swift trust in tourism industries. The target population in this research study is tourism sector of Thailand because Thailand located in southern Asia and famous for many tourism cities. Researcher has been selected three famous tourism cities such as Bangkok, Phuket and Krabi, as the sample of this study because the tourists visits these cities in large number due to the natural beauty of these cities.

Moreover, researcher observed how the big data analytics capabilities and external supply chain management ensured the collaborative performance and swift trust in these tourism cities. Researcher has been collected the data from hospitalities industries employees because they could better explain about the collaborative performance and swift trust in tourism industry. Coming towards sample size, researcher used small sample size in the previous study for the convenience of analysis but now according to the study of (Hazen et al., 2015) researcher has to select the large sample size while using covariance-bases SEM approach. In this

research study, researcher has been calculated the sample size on the bases of idea represented by (Klein, 2015), which states that number of questions*10 provides with accurate sample size. According to the calculation, sample size has been selected is 300, that's why 300 questionnaires have been distributed among the respondents. Out of which only 287 responses have been considered valid because rest of responses have been discarded due to missing values and invalid responses.

3.2. Data collection Techniques

Structured questionnaire has been used by researcher as data collection method in this research study. In questionnaire, Researcher asked about demographic information, role of data analytics capability in collaborative performance and swift trust in tourism industry and asked about mediating role of the external supply chain management in this study. Content validity of scale, which has been used in the questionnaire by researcher has to be checked before finalizing the questionnaire. Researcher used both online and self-administered questionnaire technique in order to collect the data.

3.3. Validity, Reliability and Common Bias

Validity and reliability have been assessed through AMOS and SPSS respectively. Different criteria have been used by the researcher in order to assess them. Criteria for assessing the reliability under SPSS states that Cronbach's α must have to exceed the specific limit 0.70 [19] because its values were strong at 0.75 or above. Convergent validity assessed through AMOS and it examined by three criteria. One is items loading (λ) and its threshold range is greater than 0.70, second is composite constructs reliability which has to be greater than 0.80 and third is average variance extracted must have to be greater than 0.50. Coming towards discriminant validity between constructs, it has been assessed by examining the criteria which entails that square root of AVE must have to exceed when correlated with all other constructs [20].

As far as common bias is concerned, it has been originated when the same measures have been used by respondent in order to evaluate the explanatory and dependent variables and it provided by common rater. Set of variables has been used by researcher in this study includes external supply chain

management, collaborative performance, swift trust and big data analytical capabilities. To control the risk of common bias Harman's single factor test has been used by researcher. In this test, researcher checked whether all the constructs interpreted by single factor but results report that no single factor used for accounting of most of constructs. 97% of variance accounted for by factor solution and 10% of variance accounted for by single factor. Hence, inexistence of risk of common bias has been ensured when most of the constructs accounted for by different factors.

3.4 Hypothesis Testing

Hypotheses have to be tested in order to check the acceptance or rejection status of hypotheses. It has been done through the structure equation model which runs on AMOS. Path analysis has been performed under SEM for the analysis of structure path model. Further, analysis has been done in two steps, first step is to examine the standardized path and second step is to check the significance of influenced path. Acceptance or rejection status of hypotheses have been assessed by their respective significance and t-statistics values.

3.5. Measures

BDAC was measured with the scale developed by [14], with the help of five items that were taken on a five-point Likert scale. Then ESCM was assessed by the scale developed by the researcher [15] and here four items were taken on a five-point Likert scale and were assessed. ST was measured by a scale developed by [16], four items were taken and measured on a five-point Likert scale. Finally, CP was measured by the scale developed by [17] and five items were taken which were measured on a five-point Likert scale.

4. Analysis and Findings

The present research was about the impact of BDAC on the swift trust (SWT) and collaborative performance (CoP) with mediating role of external supply chain management (ESCM) in these relationships. For this purpose, the questionnaire-based survey study was conducted to collect data from respondents. After screening, there were 287 responses that were considered for analysis. Out of 287 respondents, 58.2 percent were females and 41.8

percent were males. The demographic of education revealed that 127 respondents were post-graduated and 127 respondents were Master degree holders. There were 23 respondents in the sample who were graduated while 10 respondents were having some other education. The age of most of the respondents was between 21 and 30 years (i.e. 77.4 percent) and 14.3 percent of respondents were of age between 31 and 40 years. There were 7.7 percent respondents

whose age was between 41 and 50 years while only 2 respondents were of age greater than 50 years.

4.1. Descriptive Analysis

The descriptive statistics of all current variables have been provided in table 1 from which the mean value, standard deviation and skewness have been mainly considered to decide the normality and adequacy of the data.

Table 1. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
BDAC	287	1.00	5.00	3.4567	1.09552	-.628	.144
ESCM	287	1.00	5.00	3.6208	1.06387	-.889	.144
COP	287	1.00	5.00	3.6247	1.04444	-.935	.144
SWT	287	1.00	5.75	3.4016	1.04138	-.301	.144

The mean value of BDAC, ESCM, COP and SWT are all ranging between 1 and 5 that are the minimum and maximum values of the rating scale of these variables. The standard deviation is revealing that there is acceptable variation in all these variables. Furthermore, the values of skewness against BDAC, ESCM, COP and SWT are all more than -1 and less than +1. Hence, the normality of the current data is confirmed and the data is in position to be used for further analysis.

4.2. Convergent and discriminant validity

This analysis was proceeded by checking the internal consistency and multicollinearity in the data for which the indicators of AVE, MSV, CR and correlations were mainly considered and computed. Table 2 provides the results of discriminant validity of the data.

Table 2. Convergent and discriminant validity

	CR	AVE	MSV	MaxR(H)	SWT	BDAC	ESCM	COP
SWT	0.891	0.671	0.560	0.892	0.819			
BDAC	0.914	0.761	0.560	0.980	0.748	0.872		
ESCM	0.951	0.765	0.287	0.986	0.456	0.459	0.875	
COP	0.949	0.727	0.324	0.989	0.569	0.529	0.536	0.852

The value of CR for BDAC, ESCM, COP and SWT are more than 0.7 which means that the data and scale of all variables are reliable. The value of AVE for all of them is also meeting the threshold range (i.e. >0.5) and the value of MSV of BDAC, ESCM, COP and SWT is less than their respective AVEs so, the discriminant validity of the current data is confirmed. The correlation of each variable with itself is higher than the all correlations of the variable with other variables. It means that the convergent validity and discriminant validity of the current data are confirmed.

4.3. Confirmatory Factor Analysis (CFA)

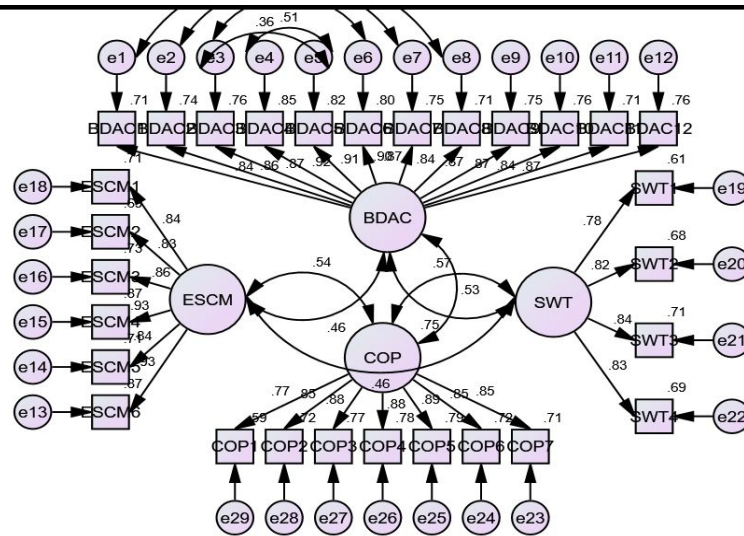
The model fitness of the current study containing the elements of BDAC, ESCM, COP and SWT was checked by running CFA in AMOS. The table 3 provides the summary of model fitness in which the key indicators along with their threshold ranges and observed values have been provided.

Table 3. CFA

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	2.551
GFI	Equal or greater .80	.821
CFI	Equal or greater .90	.941
IFI	Equal or greater .90	.941
RMSEA	Less or equal .08	.074

It can be seen in table 3 that all the key indicators of model fitness are giving acceptable values for the current model because the CMIN/DF is less than 3, the GFI is more than 0.8, CFI and IFI are more than

0.90 and the RMSEA is less than 0.08. Hence, the current model has the appropriate fitness. The CFA has been presented in figure 1.

**Figure 3: CFA**

4.4. Hypotheses Testing (SEM)

The current study tested the hypotheses through SEM in which the total, direct and indirect impacts of

BDAC on CoP and SWT were analyzed through mediation of ESCM. Table 4 provides the results of SEM.

Table 4. SEM

Total	BDAC	ESCM
ESCM	.448***	.000
COP	.508***	.359***
SWT	.691***	.145**
Direct	BDAC	ESCM
ESCM	.448***	.000
COP	.347***	.359***
SWT	.626***	.145**
Indirect	BDAC	ESCM
ESCM	.000	.000
COP	.161**	.000

Total	BDAC	ESCM
SWT	.065*	.000

*** indicates p -value <0.01 , ** indicates the p -value <0.05 and * indicates the p -value <0.1 .

The results of SEM are indicating that the BDAC has significant positive impact on both dependent variables i.e. CoP and SWT (p -value <0.01). However, the direct impacts of BDAC on CoP and SWT are not equal to the total impacts of BDAC on CoP and SWT thus revealing the existence of indirect effects. The results are confirming that the ESCM

plays the role of significant mediator between BDAC and CoP by causing a positive and significant impact of 0.359 on CoP. Furthermore, the ESCM plays the role of significant mediator between BDAC and SWT by causing an impact of 0.145 on SWT. Figure 2 is indicating the SEM. Hence, the current findings supported all hypotheses of the current study.

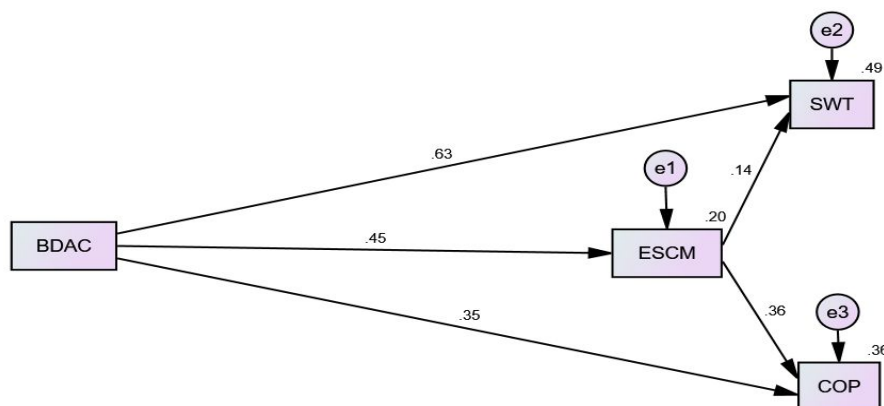


Figure 4: SEM

5. Discussion and conclusion

5.1. Discussion

The study has the aimed to know the connotation about the Big Data Analytics Capabilities (BDAC) with the Swift Trust (ST) and Collaborative performance (CP) [29]. This study has also the aimed to know about the mediating role of external Supply Chain Management (ESCM) between BDAC and ST and also to know about the mediating role of ESCM between BDAC and CP. This research proposed the following hypothesis. The first hypothesis mentioned was that there is a significant impact of BDAC on ST. This hypothesis was accepted, S.J. Childe at the University of Plymouth did research and stated that BDAS enhance the trust and collaboration between organizations. BDAC provides easy data which makes positive relations and builds ST. The second hypothesis suggested that BDAC has a significant impact on CP [30]. This hypothesis was also accepted. As per the study of “Cyril Foropon,” he said that BDAC positively affects the CP. The application of BDAC creates information processing capabilities to improve CP. The third hypothesis

suggested that there is a significant mediating role of ESCM between BDAC and ST. This hypothesis was accepted. “Akbar Zaheer” has explored the role of ESCM between BDAC and ST. The research work investigated and proved that organizations are getting benefits in improving their BDAC and ST. Organizations are getting information and saving that information for productive use. The fourth hypothesis stated that the mediating role of ESCM between BDAC and CP is positive and significant. This hypothesis is accepted. In “Bill mcevilly” research it is suggested that ESCM is playing an important role and proved a positive relationship between BDAC and CP. The result of this study showed integrated performance across all of the manufacturing sectors of one organization by understanding the true meanings of ESCM. [31]

5.2. Conclusion

The study was aimed to distinguish about the association and affiliation of BDAC with ST. The aim was also to know about the association of BDAC with CP. This study was conducted in Thailand.

Three hundred people from the manufacturing sector were considered as a sample and the information was gathered from 287 people of this sample. The questionnaire was used as data collection tool. Another determination of this paper was to know the interceding role of ESCM between BDAC, ST and CP. This study concluded that the relationship is positive between BDAC and ST and CP. And the role of ESCM is significant and moderate between BDAC, ST, and CP. The quantitative technique was used in this research as a methodology. The study can be conducted anywhere around the globe because of this general problem.

5.3. Implications of the study

Our research has significantly increased the literature material and the people can get data about these particular variables. The researchers can get data and get knowledge about the positive role of ESCM between BDAC and ST, CP. The students can get more information about this problem. This particular study has significant implications globally because nowadays manufacturing sectors are facing these challenges and they can get a solution considering this research.

5.4. Limitations and future research indications

The small sample size is the main limitation of this study. The sample size of 300 was taken from Thailand. This sample consisted of manufacturers of Thailand. The future researchers can enlarge the sample size they can collect data from more than 300 industrial sector in order to find more suitable and precise data. Our research was conducted in Thailand. The other researchers can do this research worldwide or in any other country. The other investigators can consider more than one variable as mediating. The questionnaire was used to collect the data the next researchers can use more than one data collective tool. That may help them in gathering unswerving data.

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