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# IT CAPABILITIES ON SUPPLY CHAIN PERFORMANCE: MEDIATING ROLE OF SUPPLY CHAIN AGILITY

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## Abstract

*The purpose of this paper is to investigate the IT capabilities affecting supply chain performance, explore the relationship among those identified capabilities to supply chain performance and, explore the mediating factors to the relationship with special reference to large manufacturing organizations in Sri Lanka.*

*Systematic random sampling technique was applied as the sampling technique of the study. 200 questionnaires were distributed among executives in large manufacturing organizations to collect the primary data and 160 were used for the analysis. Gathered data were analyzed by SPSS software.*

*Findings: Under the IT Capabilities, Flexible IT Infrastructure and IT Assimilation have a weak positive relationship with supply chain performance while strong positive relationship with supply chain agility. Supply chain agility has a direct strong positive relationship with supply chain performance and it is mediating the relationship between IT capabilities and Supply Chain Performance.*

*The interest for using IT in the Supply Chains in large organizations is being increased. To face the contemporary changes in the market all the activities in different layers should be integrated. There is a high possibility to increase the performance by using advanced IT applications and providing reasonable IT infrastructure. This study explains the*

*importance of considering supply chain agility as a mediator rather than using only IT applications or infrastructure. No research can be found in Sri Lankan context that explore the factors affecting IT capabilities and Supply chain performance relationship.*

*Practical Implications: Future studies are possible to conduct surveys in different angles using various control variables. Comparison of factors between different industries will provide more insights for the practitioners and as well as the researchers on the study variables.*

**Key Words:** IT Infrastructure, IT Assimilation, Supply Chain Agility

## 1. Introduction

It is very clear that companies use IT to derive competitive advantage by increasing the productivity, efficiency and effectiveness. (Clemons & Kleindorfer, 1992). For a proper knowledge management and change management in a supply chain, IT capabilities have been identified as key factors. (Ray et al., 2005; Wu et al., 2006). According to Benitez et al. (2018), IT capabilities play a significant role in increasing firm performance. IT capabilities have been defined differently by authors. According to Liu et al. (2013), previous empirical studies have controversial results regarding IT capabilities and firm performance. They further mentioned that, because of the mixed findings, researchers have been more interested to find the influential nature of IT capabilities in the supply chain context. This study is coming under the same research direction.

There are many scholars who explored that IT can act as a competitive tool in improving supply chain performance by providing timely, rich and reliable information. (Liu et al., 2009; Karimi et al., 2001). Many organizations invest more on IT facilities but it cannot guarantee supply chain performance. (Karimi et al., 2001). According to Liu et al. (2009), investigating how IT contributes to the supply chain is of significance and warrants scrutiny. Despite the significant positive relationship between IT capabilities and firm performance, each IT capability dimension has a different impact on firm performance. (Aydiner et al., 2017). There are 2 IT capabilities used here by analyzing previous literatures in order to explore the effect on supply chain performance. i.e. Flexible IT infrastructure, IT assimilation. Previous scholars have identified these 2 capabilities as factors that

companies must acquire for the development of them in a rapidly changing business environment. (Ray, et al, 2005; Wu et al., 2006; Liu et al. (2013). Recent IT and Business literatures have marked these 2 factors as critical capabilities for firm supply chain management. Also they have suggested these factors have great potential to improve the absolute supply chain performance, such as the performance of customer service processes (Ray et al., 2005).

At present, companies tend to invest more on IT infrastructure for facilitating the information and knowledge through the supply chain which finally leads to maintaining competitive advantage (Chen et al, 2007). For achieving good performance, a greater attention is felt for the business value of a flexible IT infrastructure (Rucker et al., 2011). Some scholars have also mentioned that IT infrastructure alone can't maintain competitive advantage. (Devaraj & Kohli, 2003). They further mentioned that investments on IT infrastructure will be in vain, unless IT applications are actually assimilated. In large organizations which have good supply chains and processes are enabled by IT, IT assimilation is essential for supporting the business processes (Armstrong & Sambamurthy, 1999).

Studies have found that effects of IT capabilities are mediated by other capabilities, such as corporate entrepreneurship (Rehman et al.,2018) and supply chain agility (Grant, 1996; Liu et al., 2013). They figured that IT capabilities as fundamental capabilities which shape higher-order capabilities such as supply chain agility that finally affect supply chain performance. Liu et al. (2013) pointed out that flexible IT infrastructure helps firms to exchange knowledge, align processes, and achieve operation flexibilities while IT assimilation influences the efficiency and effectiveness of business processes. Further they proposed IT capabilities support the development of supply chain agility which ultimately influence supply chain performance.

Although previous studies have explored the business value of a wide variety of IT capabilities, it's hard to find a study in the context of supply chain management. This study provides insights into the business value of operational and transformational IT capabilities, i.e., IT infrastructure flexibility and IT assimilation capability to supply chain performance. Rather than testing the direct impact of IT capabilities on financial performance, the moderating effect of Supply

Chain Agility was used here. There is no research in the Sri Lankan context, which examines IT capabilities on supply chain performance. Even though there are a number of studies on supply chains in manufacturing organizations, all studies were carried out in the capital city of Sri Lanka (Colombo and respective districts in Western Province). This study was conducted in the Southern Province of Sri Lanka.

To check this model, 5 large manufacturing organizations were selected in the Southern Province of Sri Lanka. Most of the large organizations are maintaining good supply chains with proper IT use. Therefore, researchers had to select large organizations which are manufacturing products and clearly identify the parties in the supply chain. The rest of the article is organized as theoretical background and hypothesis development, research methodology, analysis and findings finally conclusion and discussion.

Research Objectives:

- ✔ To identify the relationship between IT capabilities and supply chain performance
- ✔ To identify the relationship between IT capabilities and supply chain agility
- ✔ To identify the relationship between supply chain agility and supply chain performance
- ✔ To identify the mediating role of supply chain agility on the relationship between IT capabilities and supply chain performance

## 2. Literature Review & Hypothesis Development

According to the previous literature, performance of a firm or process comes with two types of organizational capabilities. viz. Dynamic Capability and Operational Capability. (Helfat & Peteraf, 2003). They have further explained Operational capability as the ability of a firm to execute and coordinate tasks required to perform operational activities. This capability can be considered as a high-level routine or a collection of routines. Supply chain agility is one of the higher-order capabilities, considered as a critical type of operational capability required for high performance. Helfat & Peteraf (2003) identified

Dynamic capability as a higher-level routine used to adapt operational routines and capabilities to develop new value-creating strategies.

Many scholars have mentioned that higher-order capabilities are developed through a series of lower-order capabilities. (Grewal & Slotegraaf, 2007). Most of the IT business value researches, scholars considered IT capabilities as lower-order capabilities that enabled the development of higher-order capabilities, such as agility (Sambamurthy et al, 2003). Following this logic, this study use low-order capabilities i.e. IT infrastructure and IT assimilation that can be developed high-order capabilities i.e. Supply Chain Agility which ultimately directly affects the supply chain performance.

To gain a competitive advantage, the supply chain plays a critical role in modern organizations. Supply chain entities/ parties are separate and independent. So there is a need to coordinate activities across the entities. Information is the most significant element of coordination. Information technology can be used to help implement the participation of supply chain elements in the supply chain system which leads to supply chain performance (Jahantigh & Azam Sarafrazi, 2014).

### 2.1. Supply chain performance

Supply chain performance refers "to the extent to which a firm can apply all the necessary resources and capabilities to meet customer requirements and to respond to market change in a responsive manner"(Harrison et al., 2004). Gyula (2013) identified how supply chain performance can be effected on organizational performance. According to that, marketing performance in the context of a supply chain plays in achieving the overall organizational performance. In the context of supply chain performance, 4 areas were selected. viz. financial, marketing, operations and innovation. They have further mentioned that existing empirical studies on supply chain performance measures have used accounting and financial indicators such as ROI or price/earnings. But using only accounting/financial indicators limit the dimensionality of performance in the context of supply chain. Green & Inman (2005) described supply chain performance as the ability of a supply chain I). To deliver quality products and services in precise quantities and at precise times II) to minimize total cost of the products and services to the ultimate customers of the supply chain.

## 2.2. Supply Chain Agility

This is a type of operational capability, referring to the ability of a firm to perform operational activities with supply chain partners in order to adapt or respond to market place changes (Swafford et al., 2008). Braunscheidel and Suresh (2009) defined Supply Chain agility as the ability of a firm to effectively collaborate with supply chain partners to respond to market changes. Information and products are going through different levels of the supply chain. It involves a number of linked activities such as design, manufacture, and delivery among different levels, channels and members. Therefore, to achieve competitive advantage and to perform linked activities efficiently, firms need to collaborate with partners. It is clear that Supply chain agility enables effective and efficient responses to operational changes. i.e. manufacturing, delivery (Vijver & Leung, 1997). Previous research has shown that Supply Chain Agility is not only improving daily operations. It also helps to reduce cost and increase profitability. (Agarwal et al., 2007; Swafford et al, 2006; Sambamurthy et al., 2003; Liu et al.,2013). Swafford et al. (2008) explored that when a firm has practiced a high supply chain agility will increase product customization, on-time delivery, new market entering and customer services. These factors are very crucial in supply chain performance. Chan et al. (2017) identified the significant positive impact of supply chain agility on supply chain performance in the fashion industry. Based on this Hypothesis 1 can be developed as,

H1- Supply chain agility has direct positive impact on supply chain performance

## 2.3. IT capabilities

IT capabilities refer to a firm's ability to assemble, integrate, and deploy IT resources to fulfill its business needs. (Karimi et al., 2007). IT capabilities are the combination of IT infrastructure flexibility and IT integration. (Rehman, et al., 2018). Number of IT capabilities were used by previous literature, in order to check the business value in the supply chain. IT infrastructure, IT managerial capabilities, IT assimilation capability, IT planning capability, enterprise system-enabled capabilities are some examples. (Liu et al, 2009). Basheer et al., (2019) have used different IT capability factors, which consists of IT infrastructure, IT personnel, IT knowledge, and IT re-configurability. In

this study, the researcher is planning to discuss 2 types of capabilities. i.e. IT infrastructure and IT assimilation.

*2.3.1. Flexible IT Infrastructure*

According to Saengchai and Jermsittiparsert (2019), Poor IT infrastructure can be a reason for diminishing performance in all areas including financial, operational, marketing and supply chain. Flexible IT Infrastructure refers to the ability of a firm to establish a complete set of technological resources, which provides the foundation for the development of IT applications (Ray et al., 2005). They mentioned that IT infrastructure includes the computing platform, communication networks, critical shared data, and core data processing applications. IT flexibility is explained as the extent to which these elements are connective, compatible, and modular. So, a flexible IT infrastructure is characterized by a) connectivity- connection between IT component and other components within the firm or with channel partners, b) compatibility- ability to share any type of information across any IT component within the firm or with channel partners, c) modularity- ability to change any element of the infrastructure easily and without affecting other activities (Liu et al., 2013).

Saengchai & Jermsittiparsert (2019) conducted a study in manufacturing industry, Thailand and found that there is a positive relationship between IT infrastructure and supply chain performance. They used IT standardization and IT integration under the IT infrastructure to test the positive relationship. van Wessel et al. (2016) had found the same positive relationship. Nguyet & Phung (2018) mentioned that IT infrastructure increases the delivery speed of supply chain performance. McWaters, & Hawkins (2018) developed a relationship between IT integration and Supply Chain Performance within the workplace where IT infrastructure is largely utilized. Bocken et al. (2016) pointed out that with the introduction of IT infrastructure in the business and firm network IT has increased the performance of organizational supply chains. Rehman, et al. (2018) explored that IT capability dimensions i.e.IT infrastructure has a significantly positive impact on corporate entrepreneurship dimensions which further have a contribution to enhance firm performance with these findings and literatures, hypothesis 1 can be developed as,

H2- Flexible IT infrastructure has direct positive impact on supply chain Performance

Investment only in IT in the supply chain process does not guarantee a stronger performance in processes (Wu et al., 2005). Many organizations invest more on IT facilities but it cannot guarantee supply chain performance. (Karimi et al., 2001). Some scholars have also mentioned that IT infrastructure alone can't maintain competitive advantage. (Devaraj & Kohli, 2003). Studies have found that effects of IT capabilities are mediated by other capabilities such as Trade Digitalization (Saengchai & Jermsittiparsert (2019) and supply chain agility (Grant, 1996; Liu et al. (2013). They figured that IT capabilities as fundamental capabilities which shape higher-order capabilities such as supply chain agility that finally affect supply chain performance.

A flexible IT infrastructure results in high levels of supply chain agility (Liu et al., 2013). They explain this by using 3 concepts explained above. Connectivity of IT components helps organizations to consolidate information across the channel partners. Consolidated information enables organizations to have a smooth flow of information. IT compatibility helps to span organizational boundaries and make data, information, and knowledge readily available in the firm. IT modularity enables interoperability among various IT components to facilitate the rapid development of new applications. As a result of these 3 components, the ability of a firm to perform operational activities with supply chain partners is increased. That means, a firm's flexible IT infrastructure is positively related to supply chain agility.

H3- Flexible IT infrastructure has direct positive impact on supply chain agility

*2.3.2 IT Assimilation*

Devaraj & Kohli (2003) mentioned that investments on IT infrastructure will be in vain, unless IT applications are actually assimilated. They found that use of IT and IT assimilation have a positive impact on performance. In large organizations which have good supply chains and processes are enabled by IT, IT assimilation is essential for supporting the business processes (Armstrong & Sambamurthy, 1999). IT assimilation refers to "the ability to diffuse

and routinize IT applications in business processes within and across organizational boundaries" (Liu et al 2013). This ability facilitates firms to use advanced IT applications in business activities such as marketing, procurement and communication. IT assimilation also helps firms when making strategic decisions. i.e. customer relationship management and supply chain integration. (Mishra et al., 2007). Other than Devaraj & Kohli (2003), Liang et al. (2007) identified the importance of IT assimilation on performance. Setia et al. (2011) confirmed this finding. Based on these evidences, hypothesis 4 can be developed as,

H4- IT Assimilation has direct positive impact on supply chain Performance

Researchers have suggested that IT assimilation can help to fill the traditional gaps in functions within the organization or channel partners which lead to high operational capability (Pavlou et al, 2006). As mentioned earlier, some scholars have mentioned that IT capabilities alone can't effect on supply chain performance. It assimilation has an impact on supply chain agility since advanced IT applications support customers, suppliers and other important channels to effectively connect (Mishra et al, 2007). Because of using advanced applications, integrated information flow is developed across the channel partners. Integrated information helps partners to take effective decisions on products, customers and suppliers. Therefore, hypothesis 5 can be developed as,

H5- IT assimilation has direct positive impact on supply chain agility

As mentioned earlier, previous studies have found that effects of IT capabilities are mediated by other capabilities such as Trade Digitalization (Saengchai & Jermsittiparsert, 2019) and supply chain agility (Grant, 1996; Liu et al., 2013; Chan et al., 2017) identified the mediating nature of the supply chain agility. IT capabilities were considered as fundamental capabilities which shape higher-order capabilities such as supply chain agility that finally affect supply chain performance. Therefore, hypothesis 6 can be developed as,

H6- Supply Chain Agility has a mediating effect on IT Capabilities and Supply Chain Performance Relationship

## 3. Research Methodology

The study was carried out to identify the effect of IT capabilities on supply chain performance based on the manufacturing organizations. Also, it attempts to examine the mediating effect of supply chain agility to the association between IT capabilities on supply chain performance. Cross-sectional survey method was applied to carry out this study. The population of the study was composed of 5 large manufacturing companies in southern province Sri Lanka. Southern province of Sri Lanka is the 03rd highest contributor to the national GDP compared with other regions in Sri Lanka. Most of the studies were conducted in western province, Sri Lanka. Less attention was given to this geographic area due to the distance from the capital city of Sri Lanka.

Primary and secondary data sources were used to gather data for the study. A self-administered questionnaire was used to gather the primary data from the respondents. The questionnaire consisted with five sections. The first section addressed the respondents' profile. The main purpose of the respondent's profile was to identify their background especially the age, business experience, nature of the business etc. The second part of the questionnaire used to cover the IT capabilities, third section to address the supply chain agility and the fourth section considers the supply chain performance. The last section of the questionnaire allocated for an open ended question to get the respondents' valuable ideas and thoughts with respect to the focal point of the study. Likert scale questions were applied to test the attitude of respondents against each study construct where ranked from 5-strongly agree to 1-strongly disagree. Once the questionnaire prepared, it was considered 1 manufacturing company where located nearby the researcher for the pilot study. As the views taken from the pilot study, the final questionnaire was refined and get ready for the final data collection.

The study sample consisted with 200 executives and senior executives in the selected organizations. Systematic random sampling technique was applied as the sampling technique of the study. Number of 200 questionnaires were distributed to collect the primary data and the initial response rate was 88%. Number of 16 questionnaires were not considered for the data analysis due to the incompleteness and the mismatch between the data provided. Books, journal papers,

conference papers, newsletters, periodicals, magazines and several other types of secondary data sources were applied for the data collection, further. Using the SPSS statistical software, the data was analyzed. In data analysis, Pearson correlation, linear regression and several other descriptive statistics were tested.

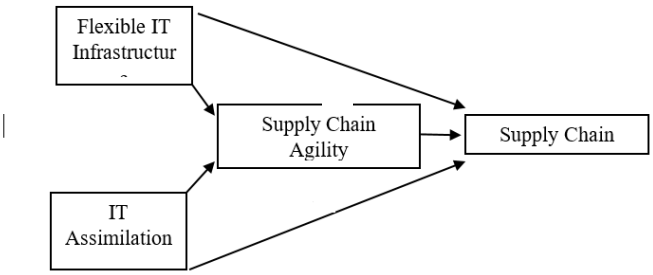


Figure 3.1. Conceptual Framework

To measure supply chain performance, 6 items were used which adapted from Stank et al. (2001). IT infrastructure flexibility was measured by using Ray et al.'s (2005) and Saraf et al.'s (2007) measurements. IT assimilation measurements were adapted from Liang et al.'s (2007) study. Finally, the firm's supply chain agility was assessed by using the 4 dimensions used by Liu et al (2009). i.e. visibility, joint planning, process integration and shared value.

## 4. Results, Analysis and Discussion

To identify the internal consistency of the study variables i.e. reliability and study constructs, Cronbach's Alpha was estimated (Table 4.1). It was considered 0.6 as the rule of thumb of reliability as suggested by Hair et al., (1998). As per the table 01, all variables recorded the Cronbach's Alpha value greater than 0.6. Thus, it can be assumed that the reliability of all measures considered to evaluate the study variables are satisfactory. As per the table given below, each variable of IT capabilities recorded high reliability (Flexible IT infrastructure = 0.774 and IT Assimilation= 0.726) which is greater than 0.6. Supply Chain Agility (0.811) and Supply Chain Performance (0.852) also recorded a significant level of reliability. This figure implies that there is a good internal consistency among each and every variable of this study.

**Table 4.1. Reliability**

| Dimension | Cronbach's Alpha |
|---|---|
| Flexible IT infrastructure | 0.774 |
| IT Assimilation | 0.726 |
| Supply Chain Agility | 0.811 |
| Supply Chain Performance | 0.852 |

*Source: Survey Data 2019*

Using the Pearson's correlation with two-tailed test of significance, the Correlation analysis has been made to investigate the relationship among independent variable (IT Capabilities), dependent variable (supply chain performance) and mediating variable – (supply chain agility), the results driven from the study can be summarized as follows.

**Table 4.2. Correlation among main study variables**

| Construct | | Performance | Agility |
|---|---|---|---|
| IT Capabilities | Pearson Correlation<br>Sig. (2-tailed) | .313<br>0.000 | .708<br>0.000 |
| Agility | Pearson Correlation<br>Sig. (2-tailed) | .711<br>0.000 | |

*Source: Survey Data 2019*

According to table 4.2, correlation coefficient between the IT Capabilities and the SME performance is 0.313 ($p < 0.05$). And, 0.758 of correlation coefficient value recorded (where $p < 0.05$) for the relationship between IT Capabilities and the Agility. Correlation coefficient value between Agility and supply chain performance is reported as 0.711 ($p < 0.05$). Finally, correlation coefficient value between IT capabilities and Agility has been reported as 0.708.

**Table 4.3. Relationship between IT Capabilities' dimensions and Supply Chain performance**

| **Dimension** | **Flexible IT Infrastructure** | **IT Assimilation** |
|---|---|---|

| | | | |
|---|---|---|---|
| **Supply Chain Performance** | Pearson Correlation | .351** | .327** |
| | Sig. (2-tailed) | .000 | .000 |
| **Supply Chain Agility** | Pearson Correlation | .792** | .762** |
| | Sig. (2-tailed | .000 | .000 |

*Sourc : Survey Data 2019*

By analyzing this table, it's clear that Flexible IT Infrastructure and IT Assimilation have weak relationships with Supply Chain Performance. Values are reported as 0.351 and 0.327 respectively in the significance level where $p<0.05$. But table 4.2. shows that Supply Chain Agility has a strong positive relationship with supply chain performance. When it comes to Flexible IT infrastructure and IT Assimilation on Supply Chain Agility, there are strong positive relationships. Values are .792 and .762 respectively where $p<0.5$.

**Table 4.4. Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics |
|---|---|---|---|---|---|
| | | | | | Sig. F Change |
| **1** | .312[a] | .271 | .411 | .339 | .000 |
| **2** | .710 | .581 | .652 | .331 | .000 |
| **3** | .707 | .532 | .621 | .302 | .000 |

*Source: Survey Data 2019*

Table 4.4 depicts the model summary of the study variables. Model 1 tests the model summary between independent variable i.e. IT Capabilities and Supply Chain Performance while Mode 2 tests the model summary between moderating variable i.e. Supply Chain Agility and Supply Chain Performance. Model 3 for testing independent variables and moderating variables. The R value of model 1 has been recorded as .312. R refers to the correlation between observed and predicted values of the independent variables. The R value ranges from -1 to +1. The sign R will show the direction of the relationship between the variables. When the value is near to +1, it's a strong positive relationship and near to -1, strong negative relationship. Therefore, it reveals that there is a positive relationship among the variables and the relationship is a weak one. R value of model 2 is .2. So, it can be considered as there is a strong positive relationship between the

variables. Model 3, R value is .707 which means there is a strong positive relationship between independent variable (IT capability) and moderating variable Supply Chain Agility.

The R Square value describes the extent to which the dependent variable can be predicted by the independent variable. The value range of R Square is 0 – 1. According to the research findings, Model 1, R Square is recorded as .271 and it addresses that, 27.1% of the variance of supply chain performance is explained by Flexible IT Infrastructure and IT Assimilation. According to the same concept, 58.1 % of the variance of supply chain performance is explained by Supply Chain Agility. 53.2% of the variance of supply chain agility is explained by Flexible IT Infrastructure and IT Assimilation.

**Table 4.5. Coefficients**

| Model | Unstandardized Coefficients | | Standard: Coefficient | t | Sig. |
|---|---|---|---|---|---|
| | B | Std. Error | Beta | | |
| (Constant) | .869 | .413 | | 2.447 | .013 |
| Flexible IT Infrastructure | .311 | .175 | .007 | 0.361 | .002 |
| IT Assimilation | .212 | .018 | .290 | 1.721 | .000 |

*Source : Survey Data 2019*

Table 4.5 indicates the strength of individual components in the IT capability construct with the supply chain agility of manufacturing organizations. Strength of individual components in the IT capability with the supply chain performance were not analyzed due to the weak relationship they had. According to the results in the table, the highest number in the beta is 0.311 for flexible IT infrastructure which is significant at the $p < 0.05$. Beta of 0.212 at the significant level where $p < 0.05$ was recorded in IT Assimilation. Therefore, using this analysis it is clear that out of the 2 dimensions in the IT Capabilities, Flexible IT Infrastructure has the highest impact on Supply Chain Agility.

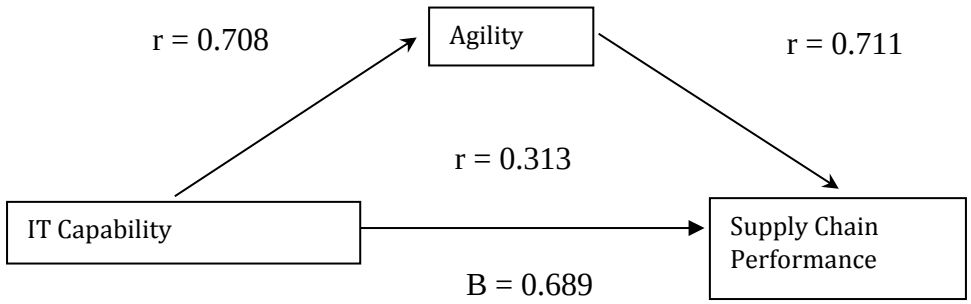

**Figure 4.1. Mediation of Supply Chain Agility on the relationship between IT Capabilities and supply chain performance**

With regard to the mediating effect of Supply Chain Agility on the relationship between IT Capability and the Supply Chain Performance, Baron and Kenney's (1986) criteria for mediation was used. As the first step, it was measured through the regression analysis and report an $R^2$ = 0.271, p < 0.000. The first requirement assessed the significant relationship between the independent variable (IT Capability) and the dependent variable (Supply Chain performance) (r = 0.313, P < 0.000). Second requirement assessed the relationship between IT Capability and the Supply Chain Agility (r = 0.708, P < 0.000) and indicated a significant relationship. Third criterion for the mediation, correlation between Supply Chain Agility and the Supply Chain performance was assessed (r = 0.711, P < 0.000). The final criteria was regressing independent variable and mediating variable against dependent variable. Accordingly, IT Capability and Supply Chain Agility regressed together and considered against the revisit intention (B = 0.689, P < 0.000).

## 5. Conclusions and Discussion

Even though some scholars have identified a strong positive relationship between IT capability and supply chain performance, they used different types of IT capabilities (IT standardization and IT integration, IT integration) or methods to assess that. (Saengchai & Jermsittiparsert (2019); van Wessel et al. (2016); Nguyet & Phung (2018); Bocken et al. (2016). The findings of this study are consistent with the previous studies that established a mediation effect by supply chain agility on IT capability and supply chain performance. It has recorded a weak positive relationship between IT capability and Supply Chain Performance (r=0.313) of manufacturing organizations in southern province Sri Lanka which is one of the objectives of the study. This implies that IT capability alone can't make a significant impact on supply chain performance. Wu et al. (2005); Karimi et al. (2001) and Devaraj and Kohli, (2003) supported this idea. Hypothesis 2 and 4 can be accepted since there is a positive relationship between the variables but it can't conclude the relationship is a strong one.

Some scholars have found that effects of IT capabilities are mediated by other capabilities. i.e. Trade Digitalization, Supply Chain Agility. (Saengchai & Jermsittiparsert, 2019; Grant, 1996; Liu et al., 2013). They figured that IT capabilities as fundamental capabilities which shape higher-order capabilities such as supply chain agility that finally affect supply chain performance. Findings of this study shows that higher order organizational capabilities of a firm such as supply chain agility can serve as the important mediator in transforming specific IT capabilities into superior supply chain performance which fulfills the 4th objective of the study and accepts hypothesis 6. i.e. Supply Chain Agility has a mediating effect on IT capabilities and supply chain performance relationship.

Previous studies constituted that IT capabilities have direct impact on supply chain agility even though there is no direct impact for performance. A flexible IT infrastructure results in high levels of supply chain agility (Liu et al 2013). It assimilation has an impact on supply chain agility (Mishra et al, 2007). According to the findings of this study hypothesis 3 ($r=.792$ where $p<.05$) and 5 ($r=.762$ where $p<.05$) can be accepted and the above mentioned studies of Liu et al (2013) and Mishra et al (2007) prove the findings. Also it fulfilled the objective no 2 of this research study.

Hypothesis 1 of this research was, Supply chain agility has a direct positive impact on supply chain performance. This was concluded that $r=0.711$ where $p<.05$. Previous researches have proven this finding. According to the previous research, Supply Chain Agility has a direct impact on supply chain performance. It helps to improve daily operations. Reduce cost and increase profitability. (Agarwal et al., 2007; Swafford et al., 2006; Sambamurthy et al., 2003; Liu et al., 2013).

### 5.1. Implications and future directions

Due to the extreme competition available in the marketplace, organizations need to keep an eye on the performance of the supply chain. Therefore, it is essential to ensure the availability of required information regarding the IT capabilities, Supply chain agility and supply chain performance in hand to make suitable decisions in manufacturing organizations. . The results derived from this study could be utilized by industry practitioners in order to enhance their

organizational performance while strengthening the areas of Flexible IT infrastructure, IT Assimilation and Supply Chain Agility. Further, the study suggests to pay much attention to supply chain agility. To achieve competitive advantage and to perform linked activities efficiently, firms need to collaborate with partners. Once change happens in the marketplace, all the actors in different levels in the supply chain have to respond to the change. By practicing supply chain agility companies can reduce cost and increase the profitability other than the performance. i.e. manufacturing, delivery. In addition to that firms can gain product customization, on-time delivery, new market entering and customer services.

Computing platform, Communication networks, Critical shared data, and Core data processing applications need to be carefully maintained by organizations. These elements should be connective, compatible and modular in order to achieve competitive advantage. No point of having the mentioned IT infrastructure for a firm, if they are not in a position to assimilate IT applications. Because larger organizations' processes and supply chains are enabled by IT, organizations need to take positive steps to continue IT assimilation.

Government and other respective facilitative bodies also will be benefited from the results driven from the study. They will be more comfortable with these results when they make policy decisions related with manufacturing organizations. Future research are motivated to do more studies on IT capabilities and performance since it is essential to update the capabilities according to the technology available. The IT capabilities could be behaved in different aspects when the economic, social, political and legal aspect may change. Thus, future studies are possible to conduct surveys in different angles using various control variables. Comparison of IT capabilities between different industries will provide more insights for the practitioners and as well as the researchers on the study variables.

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