The Mediating Role of Intention to Adopt in the Relationship between the Information Processing Requirements and Information Processing Capacity: The Application of Cloud Computing in Thai Auto Supply Chain

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***Abstract*-The main purpose of this study is to examine the relationship between information processing requirements and information processing capacity. Additionally, the intention to adopt is examined the mediating role of intention to adopt in the relationship between information processing requirements and information processing capacity in the Thai automobile industry is examined. The study has broached the conceptual model as an application of cloud computing in the Thai automobile supply chain. The SEM-PLS is adopted to examine the model. The Thai automobile industry is taken as the sample of the study. The study is of the view that the industry of cloud computing is growing rapidly to support the supply chain activities. However, there is lack of academic research on analyzing the application of cloud computing in managing supply chain theoretically. It has been revealed through literature review that the focus of researches is on identifying the applications and architectures of cloud environment. Moreover, the study proposes different limitations and opportunities related to cloud computing. The adoption of cloud computing by an organization has been examined theoretically in this research through use of information processing view and classical diffusion theory. Practitioners and academicians are given an understanding of the circumstances, which influence the firm to adopt cloud-computing technology within its supply chain.**

Keywords: *Cloud Computing, Supply Chain, Thailand*

1. Background

With the rapid growth of low-cost IT, the world has moved into the era of information. Different IT programs can improve the effectiveness of management and performance of SCprocess, as the focus of firms is on increasing competitive advantage through controlling supply chains [1, 2]. There is need for a resource, which cannot be substituted or imitated, for achieving long-term competitive advantage. Any imitable resource cannot result in long-term sustainability of competitive advantage.

The existing resources of an organization and business processes should be aligned with IT to improve the competitive landscape of an organization [3, 4]. It is crucial for the firms to implement technologies, which are linked with their strategy of SCM. Moreover, it enables to develop capabilities for improving performance of business. It has been suggested by the unique circumstances prevailing across the need of information for every firm that not every technology is suitable for the firm. The decision of the firm to implement any new IT is based on distinctive aspects of the business processes, current information systems, and organizational culture [5, 6]. The way in which these factors influence the willingness of a firm to implement cloud computing (C-C) for SCM has been investigated in this research.

The automotive industry is one of the largest and leading manufacturing industries of Thailand comprises of many large local and foreign companies. The structure of the Thai automotive industry is shown below.

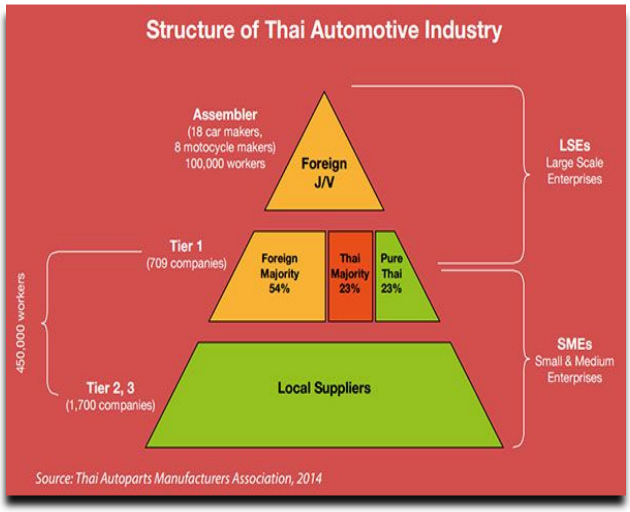

Figure 1. The structure of the Thai auto industry

C-C is a software and resource of IT. In order to fulfill the specific needs of an organization, C-C technology can be tailored, as these are dynamically reconfigurable [7]. Several advantages can be attained through C-C as compared with traditional information systems. C-C has the ability for rapid utilization and it remains scalable to meet future and needs of computing [8]. Organizations are enabled through C-C to align their IT with initiatives of the supply chain, which makes a firm agile [9]. The ability of an organization to recognize, adapt, and react to the changing environment is referred to as agility. Agility is a significant advantage, which can be realized through the use of cloud technology in SCM [5, 6, 9].

Several providers have started offering cloud technologies to manage the SCand improve organizational agility. Cloud products are offered by some service technology providers, who are well established including Google, Amazon, and IBM. These companies offer cloud products for sale, which can allow the firms to scale systems in a faster way to fulfill their capacity needs, coordination, and collaboration without losing control or incurring extra expenditures. Moreover, the market for cloud products is growing and this has attracted several new firms to enter the market. Another company i.e. Salesforce.com is offering a variety of applications related to customer relationship management. The user can readily avail the service after the initiation of the service contract. There is no need to integrate or install the actual software in the existing system It saves resources and time as well. Using any web browser, the data can be accessed by the users across the organization.[10, 11].

In order to fulfill the information needs, the literature does not involve a thorough understanding of the situation, which influences the firms to use C-C particularly in the context of the supply chain. Moreover, there is limited research related to the important aspects of adopting C-C from a theoretical perspective. This research has tried to fill the research gap by analyzing the variables, which can influence the intention of a firm to implement C-C from a theoretical perspective. It has been indicated by previous research studies that the decision of a firm to adopt an innovation is based on the abilities of technological innovation including C-C.

It has been suggested by recent researches that the adoption of innovation is affected by some granular factors related to diffusion theory such as C-C. According to Tim, et al. [12], technological innovations should be analyzed through the eye of the information process. It has been argued that different organizational aspects and related environment lead to different needs of information, which affect the adoption of technological innovations. Further, there is a need to develop theory in the literature of SCM [7]. There is a need to satisfy such need by integrating theories to give an understanding of the mechanism. The adoption of C-C by an organization has been examined theoretically in this research through the use of information processing view and classical diffusion theory. Practitioners and academicians are given an understanding of the circumstances, which influence the firm to adopt C-C technology within its SC[7, 12].

2. Literature Review

2.1 Information Processing Requirements

As per IPV, in order to reduce the risk of uncertainty and improve capabilities of decision-making, information is sourced by organizations. It has been suggested by research that the activities and environment of an organization lead to uncertainty. Therefore, it can be said that the willingness of a firm to adopt C-C technology within the SCis influenced by the cultural environment and complexity of its business processes.

2.1.1 Business process complexity (BPC)

The level of difficulty in understanding and carrying out a process is referred as process complexity. It is related to the complexities, which arise through combining different activities or units. Therefore, BPC can be defined as the level of difficulty in analyzing, defining, and interpreting the business process. It is reflected through BPC that there are changes in the business processes of an organization, which can be difficult to define, analyze, and resolve. In literature, different dimensions have been used to characterize the complexity of business processes. These dimensions are selected as per the context of the study [13, 14]. It has been suggested by literature that there are two common dimensions, which can be linked with most of the contexts. These dimensions are technology integration and knowledge intensiveness.

C-C can be altered as per the needs of information processing by an organization [7]. In contrast to traditional IT solutions, C-C can be used instantly without expansion or modifying existing infrastructure [8]. Therefore, the organization can adapt according to organizational requirements. The changing needs of computing can be fulfilled through cloud solutions, as these are scalable. In this way, the complexity of business processes can be resolved through cloud technologies. Opportunities can be recognized by the organizations because of the advantages associated with C-C. Therefore, it is suitable to implement C-C technology in the organizations to fulfill the changing needs of computing [7, 12].

2.1.2 Entrepreneurial Culture (EC)

The environment, in which the organizational tasks are accomplished are related to the way in which complexity is management within its culture [15]. It is reflected by organizational culture that there are different sides of an organization including values, beliefs, basic assumptions, technology, and models of behavior. These features explain the dynamics of a specific organization [16]. It has been shown the previous research studies that a wide range of values are included in organizational culture, which shape the behavior of a firm (i.e. task-orientation, aggression, consistency, aggression and passivity. The organizational characteristics and performance are shown by these values. For instance, innovation and flexibility is required by an entrepreneurial organization having an aggressive culture. Therefore, such an organization operates in an uncertain environment. Alternatively, entrepreneurial organizations with a passive culture require cost-efficiency, stabilization, and work in a less uncertain environment. The influence of organizational culture on different issues related to IT including its adoption, diffusion, usage, outcomes, development, and quality of information system has been analyzed in this research [17]. The entrepreneurship factor of organizational culture has been considered in this research study.

EC has been defined as the one involving innovation and dynamic commitment. New products and processes are created by entrepreneurial organizations, which are launched in the marketplace for sale. A dynamic organizational environment is created, which focuses on flexibility for complying with the environment in a faster way [3, 4]. Competitiveness is valued by such organization and opportunities are availed to perform better than the competitors (Bradley et al., 2006). The requirements for information processing are generated through such tenacity generates to identify the market opportunities and outperform the rivals.

To fulfill needs, these organizations adopt innovation in IT (Sabherwal & Chan, 2001). Alternatively, a structural and less dynamic environment is created by formal organizations. The uncertainty is mitigated through these businesses, as stabilization is valued by the company over change. Fewer requirements of information processing are required by formal organizations and they are influenced to adopt an innovation (Bradley et al., 2006). Therefore, the level with which the entrepreneur firm significantly influence the propensity to implement C-C technologies is analyzed.

2.2 Intention to Adopt

The knowledge involved in the process of manufacturing is referred as knowledge intensiveness [13]. Large amount of information is created through knowledge intensiveness, which needs organizational processing. For instance, manufacturing steps and greater information is required for the processes supporting manufacturing of products. The level of technology adoption in the process of manufacturing is referred as technology integration [14]. It has been suggested through greater use of technology that there is high level of complexity in the organizational operations [18]. The production process is simplified through automated assembly lines as compared with manual assembly. Moreover, automated assembly produces greater amount of data.

Some other dimensions related to the context of this study have been used in the result in addition to the previously discussed dimensions. These relative dimensions include number of customers, number of suppliers and the level of complexity in the business processes within the environment of SC[14, 19]. High attention is required by a diverse product portfolio for activities of stock management and inventories. This can enhance the issues linked with management of deliveries and orders [19]. In the similar way, the BPC is reflected by a higher number of trading partners.There is need for organizations to give high attention to the management of logistics function and level of stock. Greater requirements of information processes are induced through high level of complexity in the business processes [14, 20].

2.3 The capacity of Information Processing

The ability to fulfill the needs of information processing using current information systems is referred as information processing capacity. In order to fulfill such needs, there is need to incorporate flexibility of infrastructure in the information systems (Davenport & Linder, 1994; Gebauer & Schober, 2006). The level with which the system can comply with the changes without increasing its cost is referred to as flexibility. It has been described by Duncan (1995) that qualities such as modularity, compatibility and connectively can define the flexibility of IT infrastructure. It has been suggested by Byrd and Turner (2000) that there are generally eight dimensions of flexibility. These dimensions include transparency of data, business knowledge, IT connectivity, IT compatibility, and application functionality (AF). The concern of the study is with a single technology of C-C. Therefore, the study is focused on flexibility characterization.

The power of on-demand and scalable computing characterize C-C along with rapid deployment capability, low cost, and need for reduced infrastructure support [7, 8]. It has been suggested that pertinent relative benefits for C-C are reflected through AF and compatibility. This can influence the willingness of an organization to adopt innovative technology [3, 4]. Therefore, the information processing capacity has been represented by AF and compatibility. Concluding, if a high level of AF and compatibility involves in the existing infrastructure of the information system, it is less likely for an organization to use C-C. This argument has been discussed in detail in the next section.

2.3.1 Compatibility

The level of information sharing across the components of technology is referred to as compatibility [21]. It is suggested by a high degree of compatibility system that the design of the infrastructure system is reusable and sharable. Irrespective of the making, type, and manufacturer of the system, compatibility allows the use of data by other systems as well. It reflects the integration of different components of infrastructure. The existing resources of computing can be used for new activities when there is high compatibility in the system. Moreover, data can be shared in innovative ways with integration. The reusability of resources can be enhanced through standard approaches to access data. The flexibility of infrastructure is provided by such an information system because it can extend the utilization of IS. The use of an information system is enhanced through the ability of quickly adapting to new needs of information processes in a cost-effective manner. A large information processing capacity is possessed by an information system with high compatibility. The organization may feel reluctant in the adoption of C-C through this increased degree of existing capacity.

2.3.2 AF

The degree of adding new components and modules in the information system without creating a negative influence on the information system is referred to as AF. It has been suggested through research that there is a high level of AF in employing an information system, which improves the ability of an organization to comply with change [22]. Moreover, a system is allowed by AF to comply with changes without altering the software application.

There is a high number of application features, knowledge within every function, and feature coverage in an information system, which has a high level of AF as compared with the system having a low level of AF [23]. It is implied by an AF involves the integration of different features of applications in order to fulfill the potential requirements of functions

The application can be reconfigured by users to fulfill the requirements of future capacity [22]. There is a cost for AF as it includes features for using at the present time along with developing features to meet needs in the future [23]. An organization is provided with an opportunity to share information across the components of technology incompatibility [23]. Alternatively, flexibility is provided by AF for modification of application functions without any changes in the hardware or software. A high degree of capacity for information processing is required by both the compatibility and AF. Organizations are not influenced to use C-C when they already have a system with a high level of AF.

Based on the literature the study has drawn the following hypothesis

H1: BPC has a significant impact on the AF.

H2: Entrepreneur culture (EC) has a significant impact on AF.

H3: BPC (BPC) has a significant impact on compatibility (COMP).

H4: Entrepreneur culture (EC) has a significant impact on compatibility (COMP).

H5: BPC (BPC) has a significant impact on the intention to adopt (AI).

H6: Entrepreneur culture (EC) has a significant impact on the intention to adopt (AI).

H7: Intention to adopt (AI) has a significant impact on AF.

H8: Intention to adopt (AI) has a significant impact on compatibility (COMP).

H9: Intention to adopt (AI) mediates the relationship between BPC and AF.

H10: Intention to adopt (AI) mediates the relationship between entrepreneur culture (EC) and AF.

H11: Intention to adopt (AI) mediates the relationship between BPC and application compatibility (COMP).

H12: Intention to adopt (AI) mediates the relationship between entrepreneur culture (EC) and compatibility (COMP).

H13: BPC (BPC) has a significant impact on the entrepreneur culture (EC).

3. Methodology

A survey method has been used in this study. A combination of traditional measures has been used as a research instrument. The complexity of the business process was measured using six items adapted from Van Hoek [24]. The EC was assessed using two items proposed. The measure was based on the model of competing values culture [25]. A three-item compatibility measure was used for variables related to the capacity of information processing [26]. There was no suitable measure found in the literature for AF. A four-item measure was developed to determine this construct based on the concepts identified in the literature [26]. These items were assessed for content validity after generation. This has been discussed in the procedures of pilot testing. In order to determine the dependent variable i.e. intention of an organization to adopt C-C, a three-item measure was adopted. This measure was adopted by Venkatesh and Bala [27]. These researchers measured the user intention with reference to model of technology acceptance.

The measure was used from the proposition of Davis, et al. [28]. It was validated across different contexts. The analysis started with 18 items to determine the constructs. One of the items for the complexity of the business process was eliminated during the test of validity and reliability. This was done because of the failure of an item to load properly on the related construct.

The item for product modularity was not representing the construct properly. The intention of an organization for adopting C-C was measured by using three items. The EC was measured using two items. The complexity of the business process was measured using five items and compatibility was measured using three items. AF was measured through four items. Moreover, the size of IT department and size of the firm were incorporated as control variables. In several studies on innovation, these variables have been used to find an influence on the intention of adopting IT [29].

4. Results

The small sample size and data abnormality are the most common issues that the researchers face while taking organizations as the sample for analysis. The present study was faced with the same problem. For this reason, the study adopted PLS-SEM, since it is an ideal statistical approach, whereas CB-SEM was not seemed to be a good option. Following the suggestion by Hair Jr, et al. [30], 121 sample size was chosen for PLS-SEM estimation. However, a similarity exists between PLS-SEM and CB-SEM i.e. both PLS-SEM and CB-SEM approaches involve two steps estimation. In PLS-SEM, the path model estimation takes place with the determination of the measurement model (MM), followed by the determination of path relations [31].

The MM evaluation refers to the statistical estimation of the model elements. This is done to confirm the model quality and appropriateness for further application of statistical techniques. Therefore, the study observed measures, such as reliability through the MM through SmartPLS.

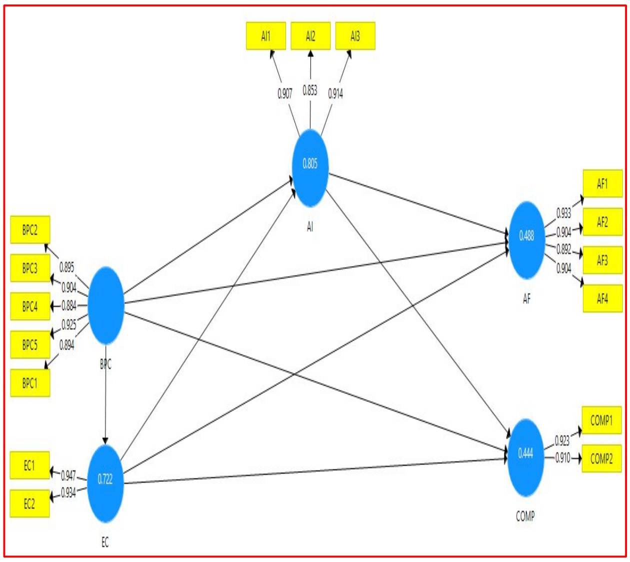

Figure 2. measurement model (MM)

Ensuring the reliability of measures is a prerequisite for the constructs' validity. According to Hosany, et al. [32] reliability shows the measures' extent to be free from any measurement errors and are capable of yielding compatible outcomes. The reliability of measures is emphasized because unreliable measures can cause defective effects on the correlation among the measures, resulting in the weakening of the correlations. Therefore, to avoid such errors, a multi-item scaled measurement was proposed (Peter, 1979), which allows excluding items from the MM to enhance scale reliability. However, no such measurement errors were witnessed in this study, since each measure has been examined multiple times.

According to Hair, et al. [33] internal consistency measure is used for assessing the reliability of items in terms of their homogeneity. The internal consistency determines the extent of particular scale items to observe the same construct of the model. In addition, Composite reliability is a measure which is commonly adopted to determine the constructs' reliability or internal consistency. Just as Cronbach alpha (CA), the composite reliability is transcribed in a similar manner. Table 5.13 shows the result of Cronbach alpha, explaining that all values for reliability are consistent with the threshold level i.e. greater than 0.70 value [30, 31, 34], thereby confirming the high internal consistency for each construct. According to Lonial and Carter [35], the reliability value is termed satisfactory if it lies within 0.70 to 0.90, contrarily, the reliability value is undesirable if it is higher than 0.90 or 0.95, since it indicates the chance that the same phenomenon is measured by majority of the variables [33]. Convergent validity helps to efficiently observe construct validity. Besides ensuring the construct's particular item validity, examining the item and cross loadings is a precondition for convergent validity. An item is considered to be a good indicator for measuring a construct if it exhibits high loadings for its own construct, on the other hand, if the item has higher loadings for other model constructs then it is indicative of an item's potential issue.

Table 1. Reliability

	Cronbach's Alpha	rho_A	CR	AVE
AF	0.929	0.930	0.950	0.825
AI	0.870	0.873	0.921	0.795
BPC	0.942	0.942	0.955	0.811
COMP	0.810	0.812	0.913	0.840
EC	0.870	0.876	0.939	0.885

The outer model loading must exhibit value equal to 0.50 or above, to be acceptable [33], however, less than 0.50 loadings for the outer model is considered to be unacceptable and in order to improve the data quality, items must be excluded from the model. This is usually done be start excluding least loaded items one after another shows the obtained loadings based on the model's construct and indicator. The indicator loadings i.e. 0.749-0.950 show high loadings for their own construct, therefore confirms that the construct validity is achieved for the MM.

Table 2. Outer loadings

	AF	AI	BPC	COMP	EC
AF1	0.933				
AF2	0.904				
AF3	0.892				
AF4	0.904				
AI1		0.907			
AI2		0.853			
AI3		0.914			
BPC2			0.895		
BPC3			0.904		
BPC4			0.884		
BPC5			0.925		
COMP1				0.923	
COMP2				0.910	
EC1					0.947
EC2					0.934
BPC1			0.894		

The average variance extracted (AVE) criterion must also be examined for assessing the MM Tzempelikos and Gounaris [36] whose value should be higher than 0.50. On the other hand, Hair, et al. [33] recommended to analyze the criterion such as factor loadings, where the acceptable range for factor loadings is above 0.70, AVE>0.50 and CR>0.70. Moreover, Henseler, et al. [31] suggested that if AVE equals 0.50, then it shows that fifty percent of the manifested variables' variance is on average explained by the latent construct. Discriminant validity is slightly different from convergent validity since it is generally employed to assess the differences or distinct features of the different measuring tools of the model constructs. Under PLS-SEM, it can be assessed with two different measures. Thus, discriminant validity is achieved when each constructs' square root value exceeds the highest correlation with other model constructs [36]. Therefore, the discriminant validity is observed for ensuring the external consistency of the underlying model.

Table 3. Validity Matrices

	AF	AI	BPC	COMP	EC
AF	**0.908**				
AI	0.669	**0.891**			
BPC	0.684	0.881	**0.901**		
COMP	0.882	0.661	0.614	**0.916**	
EC	0.607	0.838	0.850	0.551	**0.941**

The next step after determining the MM is the structural model assessment. The structural model aims to assess the correlation and regression assumptions. There is a five-step procedure presented by Hair, et al. [33] to assess the structural model. Firstly, checking for collinearity; secondly, assessing the relationship significance as well as relevance of structural model; thirdly, observing R^2 and f^2; fourthly, assessing the model's predictive relevance i.e. Q^2 and; lastly the effect sizes (q^2). In addition, the study also determined the mediating effects of variables. The structural model estimation is presented in the subsequent sections in detail.

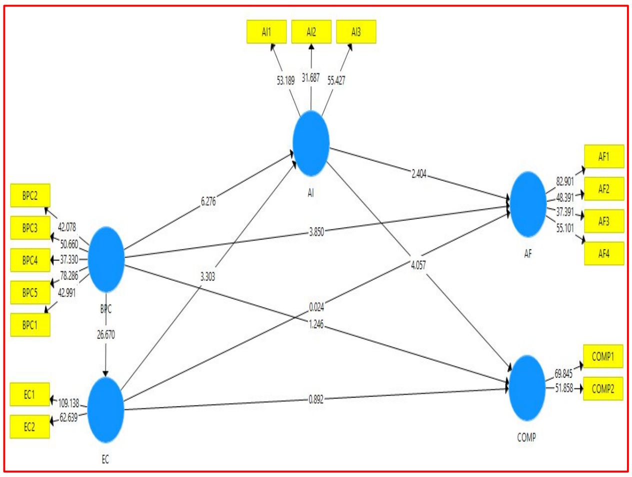

Figure 3. Structural Model

Thus, the structural model assessment begins by checking for any collinearity issues. According to Hair, et al. [33], the term collinearity referred to as the occurrence of the high correlation between the two indicators. The collinearity test results reported that all variables are in line with the threshold level, such as VIF<5 and tolerance level>0.20, and the obtained range for tolerance level is 0.243-0.439, and for VIF it is 2.278-4.122, thus indicating no multicollinearity problem in this study.

Table 4. VIF

	VIF
AF1	2.354
AF2	2.248
AF3	2.965
AF4	2.168
AI1	2.698

AI2	1.915
AI3	2.781
BPC2	2.511
BPC3	2.814
BPC4	2.342
BPC5	2.490
COMP1	1.861
COMP2	1.861
EC1	2.455
EC2	2.455
BPC1	1.469

Afterward, the significance of the structural relationships and their relevance were assessed. Hair, et al. [33] have observed that analyzing path coefficients help in assessing the hypothesized relationships. The structural model also analyses the directional relationships, path-coefficients, and the t-values, where path-coefficients are just like the standardized beta-coefficients. The study also displayed the detailed information i.e. t-values, path-coefficients, and standard errors which form the basis for the acceptance or rejection of hypotheses. The study obtained the t-values following the recommendation of Hair, et al. [33] i.e. through 5000 iterations and performing a bootstrapping procedure. The purpose of taking 5000 bootstrap samples is to ensure empirical sampling distribution for every parameter of the model. Moreover, the S.D of sampling distribution serves as an alternative to empirical S.E for model parameter Hair, et al. [33]. Thus, the significance level for this study was determined by performing the 1-tailed test, and the observed critical values.

Table 5. Direct results

	(O)	(M)	(STDEV)	|O/STDEV|	P Values	Status
AI -> AF	0.294	0.294	0.122	2.404	**0.008**	**Accepted**
AI -> COMP	0.568	0.574	0.140	4.057	**0.000**	**Accepted**
BPC -> AF	0.684	0.687	0.069	9.949	**0.000**	**Accepted**
BPC -> AI	0.881	0.880	0.023	38.238	**0.000**	**Accepted**
BPC -> COMP	0.614	0.617	0.069	8.943	**0.000**	**Accepted**
BPC -> EC	0.850	0.849	0.032	26.670	**0.000**	**Accepted**
EC -> AF	0.093	0.096	0.075	1.235	**0.108**	**Rejected**
EC -> AI	0.322	0.328	0.098	3.303	**0.000**	**Accepted**
EC -> COMP	0.105	0.109	0.105	0.997	**0.159**	**Rejected**

Table 6. Mediation

	(O)	(M)	STDEV	O/STDEV	P Values	Status
BPC -> AI -> AF	0.178	0.179	0.084	2.116	**0.017**	**Accepted**
EC -> AI -> AF	0.095	0.095	0.047	2.034	**0.021**	**Accepted**
BPC -> AI -> COMP	0.345	0.349	0.115	2.988	**0.001**	**Accepted**
EC -> AI -> COMP	0.183	0.185	0.062	2.935	**0.002**	**Accepted**

The predictive accuracy of the model can be assessed through analyzing coefficients, which is the square root of the correlation of actual and predicted endogenous construct values[33]. Furthermore, the value of R^2 shows the predictive accuracy of the model, and it ranges from zero to one, thus, the greater the value the higher the predictive accuracy. If the values for coefficient of determination equals 0.75 then it is considered to be substantial, if R^2 equals 0.50 it is considered to be moderate, and if R^2 equals 0.25 then it is considered to be weak [30, 31]. Thus, the R^2 for the targeted construct exhibits higher value if there are greater number of paths for the targeted construct. Several researchers seek for the parsimonious model as it requires few exogenous variables for explaining the data.

Table 7. R-Square

	R Square
AF	0.488
AI	0.805
COMP	0.444
EC	0.722

Subsequently, in order to assess the predictive relevance of the structural model, the size of the effect was observed. Since Q^2 value reflects the predictive relevance of the model, therefore greater than 0 value for Q^2 shows some predictive relevance, and less than 0 value shows that there is no predictive relevance of underlying path model. It can be applied to only single item construct or reflective endogenous variable.

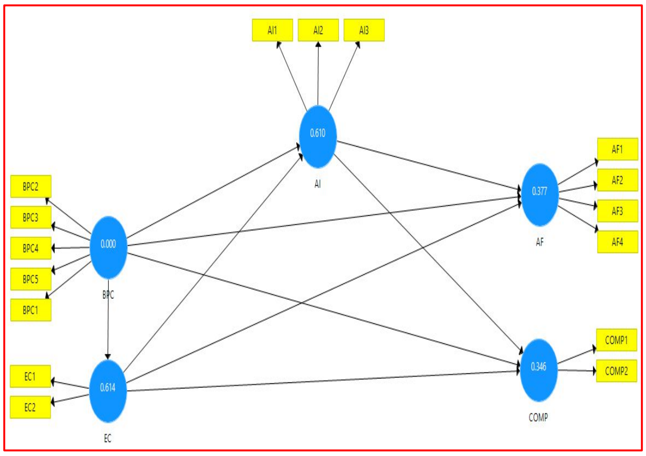

Figure 4. Q-square

Thus, the blindfolding procedure is performed to calculate the Q^2 value Hair, et al. [33]Hair, Sarstedt [33] as presented in Table below.

Table 8: Q^2

	SSO	SSE	Q^2 (=1-SSE/SSO)
AF	868.000	540.887	0.377
AI	651.000	253.947	0.610
BPC	1,085.000	1,085.000	
COMP	434.000	284.050	0.346
EC	434.000	167.373	0.614

5. Discussion and Conclusion

In the context of supply chain, several studies have worked on the adoption of IT innovation. Some of the studies have used theoretical approaches related to information processing. Several scholars argued about the need for developing a clear perspective for understanding innovation of IT beyond the traditional aspects by the theory of innovation diffusion. A model has been proposed by this study to address the research question. The model includes the use of information processing to extend the research tradition of classical innovation diffusion. The interplay among these theories has been empirically tested in this research, which gives a clear theoretical perspective to analyze the intention of a for adopting C-C technology [7, 12]. The way in which requirements of informational processing and capacity affect the intention of a firm to adopt IT innovation within its SChas been investigated by this study. Moreover, practitioners are provided with a better understanding of the situation, which can influence the organization to adopt C-C technology. Concluding, when the current information system of a firm involves compatibility or its processes are complex, there is less benefit of adopting C-C technology. Alternatively, when the information system of a firm involves a high level of AF, there is a need to adopt C-C. Managers are provided with better insight to make effective decision by analyzing the causes in favor and against the adoption of C-C.

This research is useful in its findings but is accompanied by several limitations as well [10, 11]. Initially, two factors were taken for requirements of information processing. These requirements were incorporated by other factors including government regulations and environmental turbulence. In the future, the role played by these variables can be important for investigation. Secondly, this research chose compatibility and AF to represent the capacity of a firm's information system to process information. However, there can be other factors representing the information processing ability of a firm. In this way, more variables can be considered in analyzing the capacity of information processing including system modularity and connectivity. Such capacity considerations can be incorporated in future research.

Another important aspect is of sample characteristics. In this research, the firms in the manufacturing and Auto industry were included in the sample frame. The sample can be extended to other industries in future studies for generalizing the results. For example, the service industries of the SC can be considered in future research to analyze the generalization of results to the service sector. In this study, C-C was examined as the IT artifact. C-C has some unique advantages as compared with the traditional IT SC including electronic data interchange and radio frequency identification. Because of this, we cannot generalize results to other artifacts of IT. Researchers are encouraged to extend the model through use of IT innovations in the supply chain. This will give a better understanding of the applicability of the combination of these theories to analyze the adoption of IT innovation in the supply chain.

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