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Integrating Health Drug Making with Information Technology Outsourcing in Thailand: Role of Outsourcing Capabilities on its Success

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Abstract

The role of information technology is increasing day by day with the practice of hiring resources outside the organization. It is well known that the companies outsource the material as well as capabilities to make an effective and efficient business process. The given study has a primary aim is to highlight the impact of knowledge integration capabilities, management capabilities and IT capabilities on IT outsourcing success of the drug making industry in Thailand with the help of mediating the role of delivery of IT service. Additionally, for this purpose the data has been collected from male and female respondents, out of 52% were male and 47% were female. The data has been collected through a survey questionnaire with the help of a five-point Likert scale. Under the analysis, multiple techniques are used to examine the hypothesis of acceptance and rejection. At the same time, the skewness analysis is done to measure the coefficient of the scale. The results and tables have indicated that the IT capabilities and management capabilities both have a positive effect on outsourcing success of the companies while the integration capability has an insignificant impact on outsourcing success. Furthermore, the results have indicated that the delivery of IT service also has an emerging and positive mediating role.

Keywords: *IT sourcing success, delivery of IT service, ITO contract capability, knowledge integration capability, IT architecture capability*

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1 Introduction

As nowadays, contemporary organisations have to face high level of uncertainty as well as complexity, so, it has become highly important for them to focus on adjusting their capabilities, for coping with changes in the environment. In current dynamic and uncertain business environment, many organisations have started utilising external resources and internal capabilities, in order to gain competitive advantage (Choosri et al., 2018). One of the key strategies used by companies in Thailand is outsourcing strategy. Outsourcing is a specific strategy, in which more advanced resources are used with greater efficiency and it helps in bringing strategic benefits to the outsourcing companies. With the help of outsourcing, the companies become capable of having strong network of best competencies, which are relevant to the outsourcing contracts, through which outsourcing of necessary functions, like raw materials, systems and components can be done (Dlodlo & Hamunyela, 2017). The IT outsourcing is considered to be the most important aspect in health drug making industry. With the help of focusing towards IT outsourcing, the companies operating in health drug making, have transformed in to network organisations and these have started ensuring more flexibility and agility in their organisational structures. In Thailand, there is an increased trend of adopting latest technology in organisations. The number of organisations using IT is progressing on regular basis (as shown in Table 1 and Figure 1). There are a large number of organisations in Thailand, which have started outsourcing IT in order to gain competitive advantage. In Thailand, a large number of organisations have started adopting IT and outsourcing strategies, in order to enhance efficiency as well as

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competitiveness (Gopi, Pandi, Sethupathi, Paranitharan, & Jeyathilagar, 2019). There is a significant increase in global big data market revenues in Thailand over last few years and it is forecasted to increase in near future (as shown in Figure 1 and Table 1).

Table 1: Big Data market revenues for software and services in Thailand

Source: (Depa, 2019)

Years	Amount in $ Billion
2018	42
2027	103

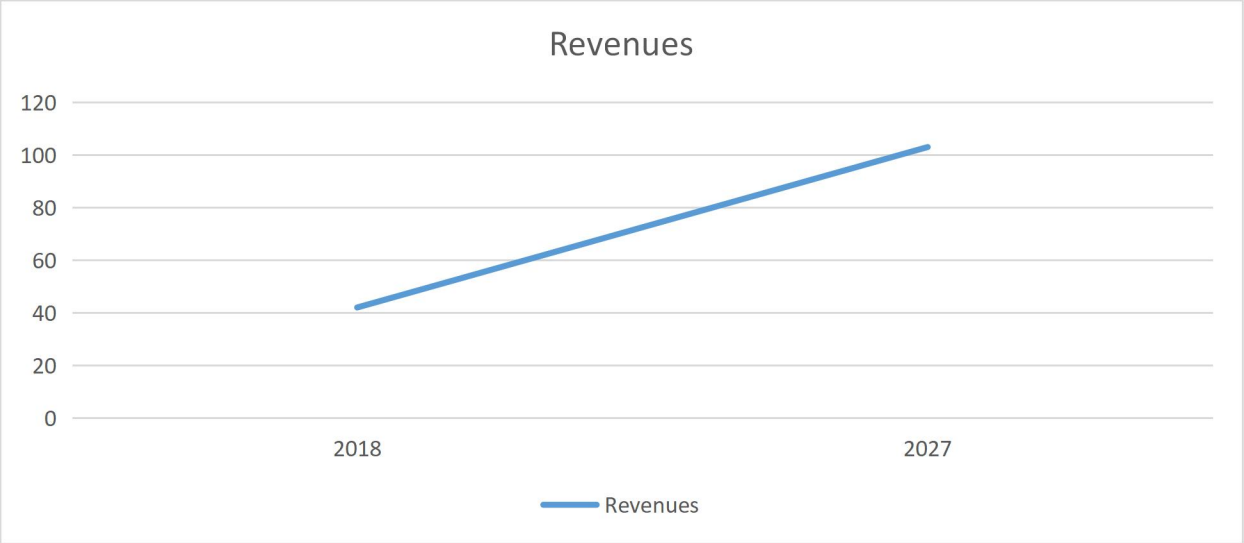


Figure 1: Graphical Representation of Big Data market revenues for software and services in Thailand

Source: (Depa, 2019)

Therefore, many scholars have started showing much interest in exploring the key factors which can bring success to Information Technology (IT) outsourcing. It is not possible for organisations to get success in IT outsourcing, while not giving importance to some key factors. Hence, it is important to study those factors which can prove to be helpful in bringing success to the IT outsourcing. In accordance with the Dynamic Capability View (DCV) which is basically emerged through the traditional Resource Based View (RBV), it is emphasized that external sources must be linked with internal capabilities and this is also helpful in explaining that how capabilities have an impact on outsourcing decisions (Gutierrez, Moreno, & Rebelo, 2017). Nevertheless, there have few studies in literature, which have focused on studying the importance of dynamic capabilities of an organisation for successful outsourcing (Hart, 2017). However, there has been no study conducted previously for investigating the impact of outsourcing capabilities on success of IT outsourcing in health drug making in Indonesia. Hence, this study has filled this gap, through studying key outsourcing capabilities' influence on success of IT outsourcing in health drug making in Indonesia. Another key contribution of this research is studying the mediating effect of delivery of IT service in the relationship between outsourcing capabilities and success of IT outsourcing (Hung, Chang, Yen, & Lee, 2015). The study is based on achieving following objectives;

- To understand the importance of IT architecture capability for enhancing IT outsourcing success.
- To examine the impact of knowledge integration capability on IT outsourcing success.
- To study the influence of ITO contract management capability on IT outsourcing success.
- To examine the role played by delivery of IT service in ensuring IT outsourcing success.

The scope of this study is to examine the influence of various outsourcing capabilities on IT outsourcing success in case of health drug making in Thailand.

2 Literature Review

2.1 ITO contract management capabilities and Success of IT Outsourcing

This set of capabilities include the ability to operationalise key requirements, in the form of detailed descriptions of service and negotiation of IT solutions' price, which need to be acquired. The contract preparation as well as negotiation are referred to as one of the main tasks of ITO lifecycle. Moreover, there is an impact of ITO contracts' characteristics on various outcomes of IT sourcing. Due to the incapability of designing and negotiating desired contracts, the client is left with those deals, in which there is little resemblance to the expectation (Kasemsap, 2020). Through preparation of draft Service Level Agreements (SLAs), an organisation can make itself protected from being forced, for accepting standard contracts of vendors. This is generally done when there is limited time for negotiations and there are quick deadlines (King, Cataldi-Roberts, & Wentz, 2017). Lancharoen, Suksawang, and Naenna (2020) claimed that contracting is a managerial capability, which helps managers in assigning roles and responsibilities to parties and deciding how communication must be done by parties. The contract management capability is considered to be highly important for bringing success to IT outsourcing. The contract management capability is defined as the degree to which a client organisation has capability of writing and negotiating contracts with IT vendors (Nguyen, Eikebrokk, Moe, Tapanainen, & Dao, 2016; Egbuniwe, 2019). As per ITO contract management capability, the firm gets involved in writing SLAs, through which key business needs are reflected and desired SLAs are negotiated with vendors, in order to make a strong foundation to monitor and measure the performance of vendors. This helps in enhancing the satisfaction level with performance as well as deliverables of vendors (Nutdanai, Pornthip, & Sanpanich, 2016). On the basis of this, following hypothesis is formulated;

H1: *There is a significant impact of ITO contract management capabilities on success of IT outsourcing.*

2.2 IT Architecture Capability and Success of IT Outsourcing

In order to outsource information technology in organisations, there is a need of giving considerable importance to the development of IT architecture. It is important to have in-built IT architecture in order to ensure success of IT outsourcing. Information technology architecture is the process used to develop the methodical specifications of IT, guidelines and models, through the use of different information technology concepts. Over the last few decades, there has been a development of these processes in response to the need for coherent approach for delivering the information technology capabilities (Ramoa et al., 2018; Basiouni, 2020). Somjai and Jermsittiparsert (2019) claimed that IT architecture capability is developed through information technology product vendors as well as independent consultancies. When the management of organisations focus on improving IT architecture capability, then, this helps in creating real experiences in the marketplace of IT. Besides this, Sompong and Kamonchanok (2017) stated that for ensuring success of outsourcing IT, there is a need of giving considerable importance to collaboration amongst stakeholders of industry. The Information Technology outsourcing depends on best practice IT architecture and it is used for encouraging the use of open technology standards as well as interoperability of global technology. While giving considerable importance to Information Technology (IT) architecture, the IT managers are responsible for making appropriate plans related to information assets in a firm, which include physical design of building, in which hardware is present.

H2: *IT architecture capability has a significant impact on success of IT outsourcing.*

2.3 Knowledge Integration Capability and Success of IT Outsourcing

Knowledge integration capability is referred to as a collaborative as well as purposeful process, which is used to combine complementary knowledge bases. This in turn results in creating new knowledge used for the purpose. This depends on the reasoning by scholars, according to whom KI is understood as the process used to combine as well as apply dispersed and specialised knowledge in different activities of an organisation (Xiao, 2018). Yang and Zhao (2016) claimed that while ensuring high knowledge integration capability, the management of an organisation focuses on combining and coordinating component knowledge bases and the new knowledge is created through combining bases of knowledge on a system level. In addition to this, Ramoa et al. (2018) stated that in accordance with resource-based theory, IT outsourcing is done through the transfer of IT related resources as well as knowledge in both directions. The IT outsourcing is done through the client to vendor and also from the vendor to the client. Kasemsap (2020) stated that complementary that IT knowledge is acquired by the client, which should be combined in to own internal routines, individuals and processes. In addition to this, it is important to transfer the particular routines as well as process knowledge from the client to the vendor. In these cases, both parties become capable of filling the gap of having lack of enough resources, by transferring and integrating the knowledge at the time of building outsourcing relationship. With the help of these transfers of knowledge and integration, shared understanding between vendor and client is generated. This helps both parties in getting an understanding about functionality of software system and design and this ultimately helps in supporting the business objectives of a project. It has been argued by Nguyen et al. (2016) that knowledge integration proves to be helpful in reducing costs linked with execution of a project and improving project performance. There is an increased dependence of an outsource IT project on effectiveness of knowledge integration by the client and vendor. Based on this, following hypothesis is developed;

H3: *Knowledge integration capability has a significant impact on success of IT outsourcing.*

2.4 Mediating Role of Delivery of IT Service

The delivery of IT service is considered to be highly important for ensuring success of IT outsourcing projects. The successful delivery of IT service is defined as the extent to which there is a fulfilment of terms of contracts between suppliers and an organisation. In this conceptualization, there is an involvement of different important aspects; perception of vendors' performance with respect to service-level agreements, output's quality and satisfaction with the cost (King et al., 2017; Vargas-Hernández & Jiménez-Solís, 2019). It is the responsibility of both vendor and the firm to give considerable importance to ensuring successful delivery of IT service, so that its outsourcing can be done successfully. The management of a firm has the responsibility of ensuring successful delivery of IT service. It plays a key role in enhancing the firm's capability of outsourcing its IT project. It is not possible for a firm to ensure success of IT outsourcing projects, without focusing on successful delivery of IT service (Nguyen et al., 2016). So, following hypothesis is developed accordingly;

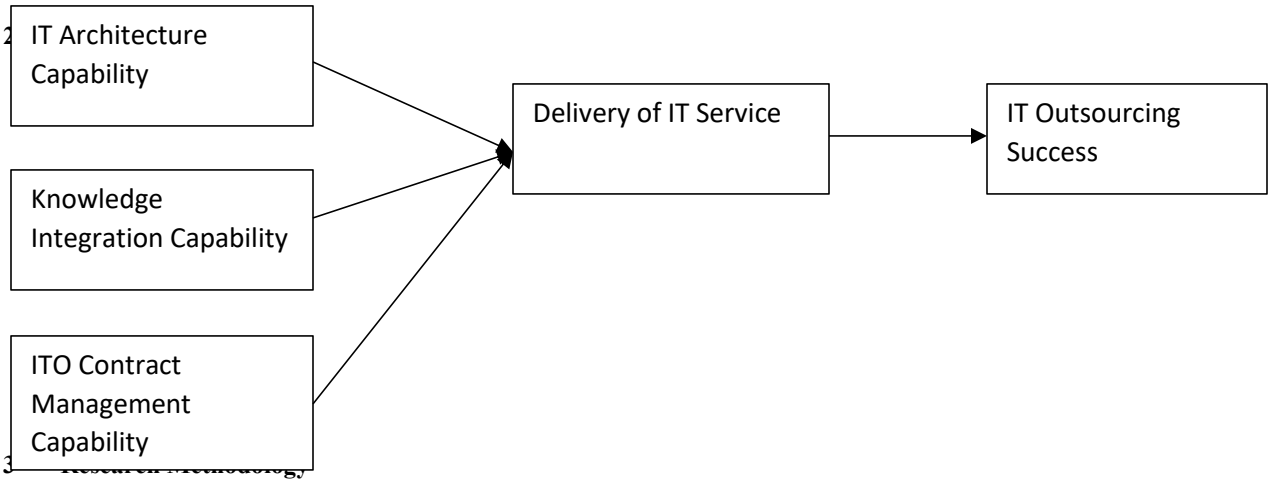
H4: *Delivery of IT service significantly mediates the relationship between ITO contract management capabilities and IT outsourcing success.*

H5: *Delivery of IT service significantly mediates the relationship between knowledge integration capability and IT outsourcing success.*

H6: *Delivery of IT service significantly mediates the relationship between IT architecture capability and IT outsourcing success.*

2.5 Theoretical Framework

2.6



3 Research Methodology

A cross-sectional survey has been carried out at the organization-leveling in the health drug-making industry of Thailand which have outsourced some or all of their IT activities.

3.1 Measures

The constructs of the proposed model are measured through a questionnaire using the five-point Likert-type scales that range from "strongly disagree" to "strongly agree", 1 and 5 respectively. IT outsourcing success has been measured using 4 items to capture the ITO objectives (Grover, Cheon, & Teng, 1996; Saunders, Gebelt, & Hu, 1997). Successful delivery IT services has been measured using 4 items adapted from various past researches (Ho, Ang, & Straub, 2003; Poppo & Zenger, 2002). Five items were used to measure the capabilities of contract management that were adapted from multiple studies (Argyres & Mayer, 2007; Cullen, Seddon, & Willcocks, 2005; Ranganathan & Balaji, 2007). The items for Knowledge integration and ITO architecture capabilities have been developed newly for this study by literature review.

3.1 Validating the measures

For the purpose of this study, the measurement items were adopted with the help of numerous previous studies. The items were modified through the pretest of the survey that involved 25 respondents, 3 experts from the field and 2

academics that had experience in IT outsourcing. The respondents advised some changes regarding the constructs and a few missing constructs were pointed out. Changes were made and the final survey was administrated.

3.2 Population and Sampling

In this research, data has been collected against each variable through the instrument of online questionnaire. The sampling frame of these firms are based on the 2017 Industrial Census in Thailand. First of all, an exhaustive list of firms was extracted from the sample frame that had been outsourcing IT processes for a time frame of more than three years. In the next step, random sampling techniques were used to isolate 520 registered automotive firms in Thailand. Key informants were selected from each of these firms. The key informant was selected from top management positions in the firm. This technique of sample selection is convenient and provides a good sample which can impose strong opinions about the issue under study. Online questionnaire was sent to 520 selected sellers, out of which only 423 were returned. 316 of the respondents were the selected on the basis of being compete and valid samples while the rest were discarded. Moreover, it was made sure that the respondents had been working at their current positions for more than 2 years.

3.3 Statistical analysis

Structural equation modelling has been used for testing the validity of the proposed hypotheses (Bollen, 1989). Influence exerted by various latent variables has been analyzed through SEM model fitting because it allows for the inclusion of predictors. Mediation tests are conducted to show the direct and indirect impacts on IT outsourcing through the mediation impact of. Bootstrapping procedure is used for mediation effect testing. This procedure provides the benefit of no assumption regarding the distribution shape (Preacher & Hayes, 2004). Fit statistics were used to ensure model fitness.

4 Findings

316 respondents were selected, out of which 52.2 percent were males and 47.8 percent were females. 43.2 percent of the sample had post-graduation degrees and 33.2 had master's degrees, showing the sample is highly educated. The division based on age group shows almost balance (approx. 30% each) number of people in 31-40 and 41-50, showing that 60% of the sample has mature and accurate age limit. Table 1 summarizes the results of descriptive analysis. The minimum and maximum are according to the selected Likert scale (1-5), showing that there is no outliers in the data. Skewness measures show that coefficients of all scale items are within the -1+1 range, therefore the data follows a normal distribution.

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
ITArchCap	316	1.00	5.00	3.4968	1.12232	-.741	.137
KMIntCap	316	1.00	5.00	3.4981	1.14991	-.674	.137
ITOConMC	316	1.00	5.00	3.5620	1.10207	-.792	.137
BeITServ	316	1.00	5.00	3.5625	1.08409	-.834	.137
ITOuServ	316	1.00	5.00	3.4430	1.12560	-.552	.137
Valid N (listwise)	316						

The KMO test checks for the sample adequacy and analyzes the sample for relevancy among variables. The KMO value is .927 for this data, which is greater than 0.8 and the results of Bartlett's test are also significant. Thus the sample is adequate and unrelated, it is fit for factor analysis.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.927
Bartlett's Test of Sphericity	Approx. Chi-Square	6408.823
	Df	210
	Sig.	.000

Table no.3 is summarizing the results for the rooted component matrix, which is a part of CFA. The component loadings of all scale items is presented in table 3 show that each scale item represents its contribution in the overall variance of the construct since all are greater than 0.7 and therefore, significant. The factors haven't been observed to cross-load against each other as well.

Table 3: Rotated Component Matrix[a]

	Component

	1	2	3	4	5
AR1					.737
AR2					.787
AR3					.820
KI1	.783				
KI2	.829				
KI3	.833				
KI4	.842				
KI5	.830				
OC1		.833			
OC2		.841			
OC3		.882			
OC4		.828			
OC5		.789			
BS1				.794	
BS2				.847	
BS3				.830	
BS4				.815	
OS1			.848		
OS2			.870		
OS3			.881		
OS4			.886		

Convergent validity is assessed on the basis of CR and AVE values. Table 4 shows that all of the CR values are greater than 0.7 and therefore the scales are internally consistent and AVE values are supposed to be greater than 0.5 to verify convergent validity (Hassan, Hameed, Basheer, & Ali, 2020; Iqbal & Hameed, 2020), and as table 4 demonstrates all AVE values of scale items are above the threshold value, ensuring the convergent validity of scale items. The MSV values are less than the AVE values and self-correlation coefficients are also higher than those of the variable-variable correlation. Thus discriminant validity is also present.

Table 4: Convergent and Discriminant Validity

	CR	**AVE**	**MSV**	**BS**	**AR**	**KI**	**OC**	**OS**
BS	0.922	0.747	0.342	**0.864**				
AR	0.889	0.729	0.396	0.568	**0.854**			
KI	0.953	0.803	0.396	0.585	0.629	**0.896**		
OC	0.945	0.776	0.376	0.481	0.531	0.613	**0.881**	
OS	0.937	0.787	0.279	0.465	0.528	0.367	0.420	**0.887**

The model fitness is established on the basis of CFA results and table 5 shows that the current values are in accordance with the prescribed limits i.e. factor dependency is well represented by the model in figure 1.

Table 5: Confirmatory Factors Analysis

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	2.268
GFI	Equal or greater .80	.892
CFI	Equal or greater .90	.964
IFI	Equal or greater .90	.964
RMSEA	Less or equal .08	.063

Figure 1: CFA

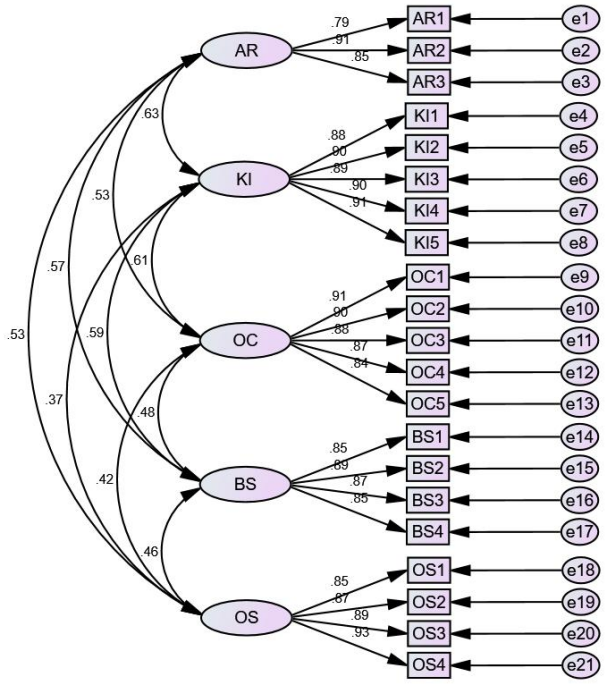
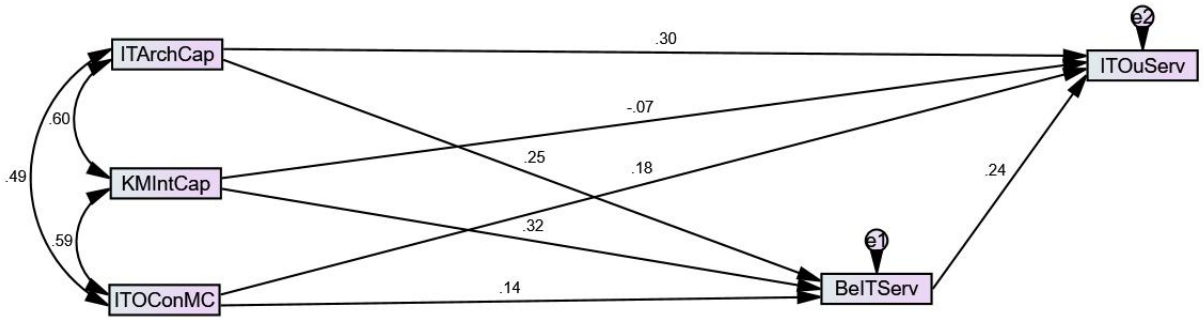


Table 6: Structural Equation Modeling

Total Effect	**ITOConMC**	**KMIntCap**	**ITArchCap**	**BeITServ**
BeITServ	.140**	.320***	.252***	.000
ITOuServ	.215**	.005	.358***	.238**
Direct Effect	ITOConMC	KMIntCap	ITArchCap	BeITServ
BeITServ	.140**	.320***	.252**	.000
ITOuServ	.182**	-.071	.298***	.238**
Indirect Effect	ITOConMC	KMIntCap	ITArchCap	BeITServ
BeITServ	.000	.000	.000	.000
ITOuServ	.033	.076**	.060**	.000

The table no.6 summarizes the hypothesis testing, done through structural equation modeling. The results clearly show that there is the direct impacts of ITOConMC and ITArchCap on ITOuServ are significant and positive with coefficients of 18.2% and 29.8% respectively while that of KMIntCap is negative, but insignificant. The mediation of BeITServ is significant for all three variables with impacts of 14% for ITOConMC , 32% for KMIntCap and 25.2% for ITArchCap.

Figure 2: SEM



5 Discussion

A study by Bals and Turkulainen (2017) highlights that IT outsourcing is a significant process for many sectors in achieving better outcomes by practicing using external service providers that provide all the functions needed by a firm. The study examined the role played by outsourcing capabilities in enhancing the IT outsourcing capability of the firm and the initial results of this given study indicate that IT architecture capabilities put a huge impact on enhancing the IT outsourcing capabilities of the firm is this because IT architecture capability develop and execute a system of vision and principles and also enable faster changes in systems that are IT-based and this advantage positively impact ITO of the firm. Therefore, the first hypothesis of the study has been accepted.

Further results of the study indicate that ITO contract management capabilities can also positively influence the process of ITO because ITO contract management capabilities help to ensure firm programs that drive IT plans of the business that is why the hypotheses have been accepted. Furthermore, the findings of this research indicate that the delivery of IT services also positively mediates the relationship between ITO contract management capabilities and ITO of the firm, so the hypotheses have been accepted.

6 Conclusion

The result of this research paper concludes that the utilization of Information Technology to integrate Health drug Making has impacted a successful impression In Thailand. Information technology outsourcing in integrating has a pivotal role. To analyze this, the data was gathered by the total number of 316 employees of the different firms in Thailand. The calculated figure about this 52.2 was male and 47.8 were of the female. The study suggests that such outsourcing has a unique role in improving the capabilities of the firms.

6.1 Implications and Limitations

This study has impacted a positive influence and this also helped a lot at management level to overcome the issues regarding drug making. The study also suggests that it has some limitations and must have to follow these limitations to achieve a positive and good output and avoid a difficult scenario. Some of the limitations of this research study must be noted. First, relying on the single mediating variable is a limitation and restriction of the study, hence, it is proposed to future analysts that they should add other mediating as well as moderating variables in their research model for better and wider results. Second, the cross-sectional nature of the study does not provide a wider insight into the dynamic interactions of the firm, so, future studies must adopt longitudinal nature for better insights and outcomes.

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