A Qualitative Evaluation of an Instrument To Measure Organisational Motivations for Inter-Organisational Systems Adoption

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ABSTRACT

Inter-organisational systems (IOS) form the backbone of today's e-commerce between organisations. However, very little is reported about how these systems are introduced. An exception is the work of Rahim et al. [2006; 2007], who proposed the IOS Adoption Motivation (IMM) model. This model explains variations in IOS introduction processes by relating organisational motivations for adopting a given IOS solution. The model has been partially tested using qualitative case study protocol. As a result, the statistical generalisation of the model is not yet possible. This paper attempts to evaluate an instrument that measures organisational motivations for IOS adoption and then describes a rigorous qualitative process to validate that instrument. The instrument is useful to the e-commerce researchers because it enables them to establish statistical generalisibility of the IMM model. It is also beneficial to e-commerce/IT managers because it enhances their confidence in the ability to use the IMM model to avoid the uncertainty associated with IOS introduction by choosing appropriate adoption process.

Keywords: inter-organisational systems; locus of motive; instrument, motive, IOS

1. INTRODUCTION

With the rapid increase in business-to-business (B2B) transactions, the significance of inter-organisational systems (IOS) has become even more valuable [Han and Kaufman, 2008]. In broad terms, IOS refer to a class of information systems that facilitate the exchange of products, services, and information between organisations [Bakos, 1991] and include such technologies as electronic data interchange (EDI), Web-based EDI, and Internet-based supply chain management systems among others [Lu et al., 2006]. IOS have long been regarded as increasing business effectiveness [Byrd and Turner, 2000] because they allow organisations to electronically transact more efficiently with their trading partners [Kaefer and Bendoly, 2000] and provide a platform for entire supply chains to reduce wasteful inventories by reacting effectively to customer demand and jointly planning product introductions and promotions [Soliman and Janz, 2004].

Realising the potential IOS benefits (as indicated above), however, is not easy. Hence, organisations cannot assume that introduction of IOS is straightforward and would yield theoretically predicted benefits. This is because of the complexity associated with IOS technology, which requires a certain level of technological sophistication on the part of organisations and cooperation from the business partners. Hence, it is important for organisations to follow appropriate processes to introduce these systems to maximise the promised business benefits.

It has been reported, however, in the IOS literature that different organisations follow different processes even for introducing similar types of IOS technologies [Johnston and Gregor, 2000]. To address this concern, the IOS Adoption Motivation (IMM) model has recently been proposed [Rahim et al., 2007]. The model explains variations in IOS introduction processes by relating organisational motivations for adopting a given IOS solution. The IMM has been initially applied in the Australian pharmaceutical and automotive industry sectors using a qualitative case study approach [Rahim et al., 2006; Rahim et al., 2007].

Even though the IMM contributes to knowledge by improving e-business researchers' understanding of the IOS adoption phenomenon, it still suffers from two weaknesses. First, in developing the IMM, the underlying dimensions of organisational motives were not identified adequately. Second, a precise construct for measuring various types of organisational motives was not developed. Hence, the case study protocol used by Rahim and his co-researchers to capture organisational motives for IOS adoption in its current form cannot be operationalised as a valid research instrument to be administrated through surveys. This in turn inhibits establishing statistical generalisability of the IMM.

To address these weaknesses in our previous study, we have developed a theory-driven preliminary instrument for measuring organisational motives for IOS adoption based on a critical review of three streams of literature [Eklim and Rahim, 2007]. The instrument, however, was not evaluated; hence, it is not

clearly known whether IS/IT practitioners would have confidence in the administration of the instrument. In this article, we report our experience of how two groups of participants (comprising IT academics and doctorate candidates having prior industry experience in the area of e-commerce) evaluated the instrument.

The work reported builds on our prior work in which a theory-driven instrument was developed [Eklim and Rahim, 2007], and extends that work by presenting additional qualitative evidence in support of the instrument's relevance in actual settings. The paper thus makes a significant contribution to the body of e-business literature because the validated instrument could be used in surveys to help establish statistical generalisibility of the IMM model, which, in turn, improves researchers' understanding of IOS adoption/implementation phenomenon. The instrument is also beneficial to e-commerce/IT practitioners because it increases their confidence in the ability to use the IMM model for predicting adoption processes and IOS benefits, which facilitates strategic planning for IOS adoption.

The remainder of the paper is organized as follows. Section 2 provides an overview of the IMM model. Then, drawing on the IMM model, Section 3 provides two sets of propositions relating organisational motivations for IOS adoption with IOS introduction processes and expected outcomes. Section 4 provides a description of the various types of fundamental motives that underlie the IMM model. These three sections together provide the context background necessary to understand the need for developing an instrument. Section 5 describes the research approach, and Section 6 provides a brief description of how the preliminary instrument was developed. Section 7 discusses the qualitative evaluation of the instrument (which occurred in two stages). Section 8 is a discussion of changes in the instrument at various stages. Section 9 highlights the contributions of the paper and indicates directions for further research.

2. IOS ADOPTION MOTIVATION MODEL: AN OVERVIEW

The IMM describes organisational "motivation" to be "a desire of an organisation that prompts it to act in a certain way for adopting an innovative system such as inter-organisational system" [Rahim et al., 2006]. The model (shown in Figure 2) is based on the fundamental premise (depicted in Figure 1) that organisational motivations determine the processes through which a given IOS solution is introduced within an organisation [Rahim et al., 2007].

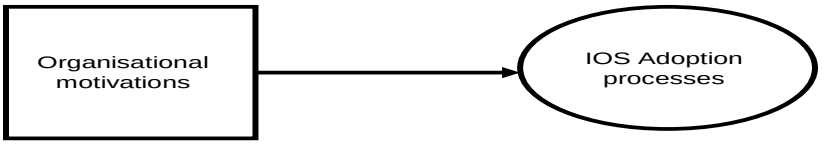

Figure 1. Relationship Between Organisational Motivations and Adoption Processes

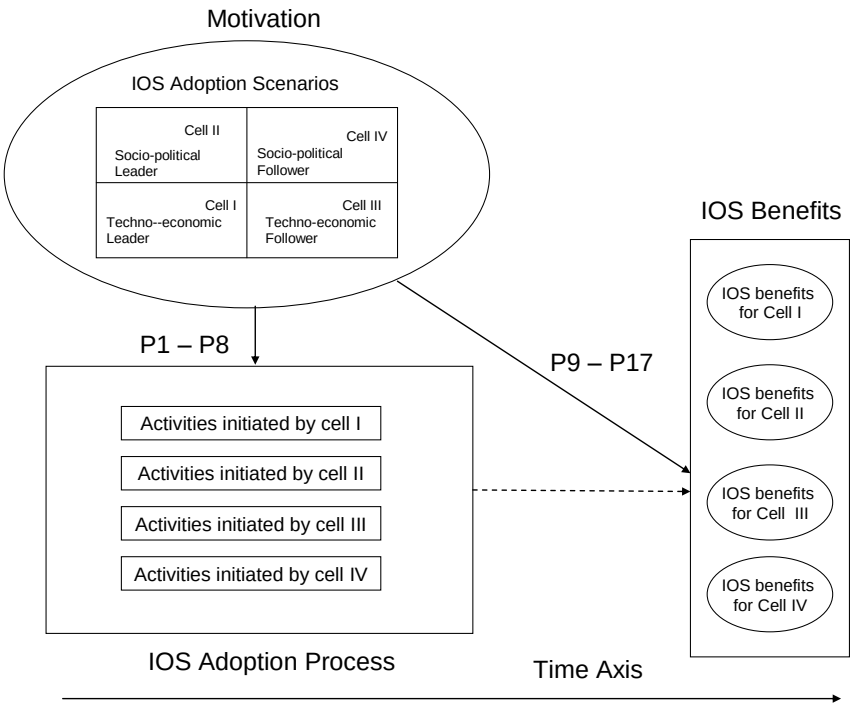

Figure 2. IOS Motivation Model (IMM)

The model in Figure 2 classifies organisational motivation along two dimensions (locus of motivation and type of motivation), and identifies four distinct motivation scenarios – techno-economic leaders, socio-political leaders, techno-economic followers, and socio-political followers. These scenarios (which are shown as cells in Figure 2) are proposed in recognition of the existence of various types of organisational motives (e.g., coercive force, normative relations, economic gains, and gaining status) and the source (i.e., internal or external) from which such motives originate. Each scenario is briefly described below.

Cell I represents the "Techno-economic Leader" scenario, which is characterized by an internal locus of motivation and a techno-economic type of motivation. This scenario occurs when organisations internally develop a direct economic motive, and invest in an IOS project voluntarily, believing that the investment will improve organisational performance with regard to internal efficiency and competitiveness in the marketplace.

Cell II represents the "Socio-political Leader" scenario, which is characterised by an internal locus of motivation and a socio-political type of motivation. This scenario occurs when organisations invest in IOS voluntarily to realise their own socio-political motives. These organisations initiate an IOS project internally for reasons other than immediate efficiency gains, but nevertheless with a clear intention of perhaps portraying either a "progressive" or "customer caring" image in the industry, or with the realisation that there is no other way forward, given their trading partner's IOS adoption strategies.

Cell III represents the "Techno-economic Follower" scenario, which is characterized by an external locus of motivation and a techno-economic type of motivation. This scenario occurs when an organisation is approached either by its business partners or by any other influential organisation about IOS adoption and, having evaluated the potential economic benefits of the IOS, invests in it voluntarily. Although the motivation to adopt IOS is generated from external sources, the decision is made based on an economic motive. Techno-economic followers generally do not build an IOS, but simply embrace a standard IOS developed either by the business partner that initiated the IOS project or by a third party. However, even though techno-economic followers are not the initiators of IOS projects, they remain proactive users of IOS.

Cell IV represents the "Socio-political follower" scenario, which is characterised by an external locus of motivation and a socio-political type of motivation. This scenario occurs when an organisation is approached by its trading partner or a third-party organisation to adopt an IOS, and a decision is made based on a socio-political motive. Socio-political followers generally do not develop an IOS, but embrace an existing IOS solution developed by partners or others parties. However, unlike techno-economic followers these organisations largely remain passive users of IOS and introduce IOS for reasons such as legitimacy, compliance, influence, or social status.

3. PROPOSITIONS DRAWN FROM THE IOS ADOPTION MOTIVATION MODEL

The IMM predicts different introduction processes to be initiated by organisations representing different motivation scenarios. According to the model, the benefits that are likely to arise as a result of IOS adoption can also be predicted once an organisation is classified into a particular motivation scenario based on its type of motivation and locus of motivation for a particular IOS project. Two sets of propositions are associated with the model. One set (i.e., P1 to P8) is concerned with the relationships between motivation scenarios and IOS adoption processes. Another set (i.e., P9 to P16) relates motivation scenarios and IOS benefits. These two sets of propositions are listed in Tables 1 and 2. Detailed discussions on these propositions are reported in Rahim et al. [2006; 2007] and hence are not reproduced here.

4. MOTIVES UNDERLYING THE IOS ADOPTION MOTIVATION MODEL

It is argued that, although four distinct motivational scenarios (shown as cells in Figure 2) are included in the IMM model, organisations are likely to be influenced by multiple motives to adopt an IOS solution. Therefore, it is essential to measure motives using a numeric scale rather than classifying them on a binary categorical scale. In response to this realisation, in our previous study [Eklim and Rahim, 2007], we have proposed a theory-driven preliminary instrument that includes 42 items (measured on a 5-point Likert scale) capturing six fundamental motive types and two loci of motives (which eventually led to the formation of four motivational scenarios in the IMM model).

Each of these motives for IOS adoption is described below. A summary of these motives, their underlying dimensions, and the number of items used in operationalising each motive in the instrument is shown in Table 3. In this paper, we report how that preliminary instrument was evaluated using a systematic qualitative approach.

Table 1. Propositions Concerning How Motivation Influences IOS Adoption Processes

Propositions	IOS Motivation Scenarios				Activities
	Techno-economic leaders	Socio-political leaders	Techno-economic followers	Socio-political followers	
P1	Likely to	Likely to	Likely to	Unlikely to	Prepare an IOS implementation plan
P2	Likely to	Unlikely to	Likely to	Unlikely to	Initiate cost-benefit analysis of IOS
P3	Likely to	Unlikely to	Likely to	Unlikely to	Perform a post-implementation review of IOS
P4	Likely to	Unlikely to	Likely to	Unlikely to	Integrate IOS with back-end IT systems
P5	Likely to	Unlikely to	Unlikely to	Unlikely to	Introduce changes in the business practices
P6	Likely to	Likely to	Likely to	Likely to	Organise training on IOS
P7	Unlikely to	Likely to	Likely to	Unlikely to	Apply pressure on partners
P8	Likely to	Likely to	n/a	n/a	Market IOS concept

Note: “n/a” means not applicable.

Table 2. Propositions Concerning How Motivations Influence IOS Benefits

Propositions	IOS Adoption Scenarios				Benefits
	Techno-economic leader	Socio-political Leader	Techno-economic Follower	Socio-political Follower	
P9	Likely to	Likely to	Unlikely to	Unlikely to	Experience a reduction in paperwork
P10	Likely to	Unlikely to	Likely to	Unlikely to	Experience fewer errors in data
P11	Likely to	Unlikely to	Likely to	Unlikely to	Experience a reduction in inventory
P12	Likely to	Unlikely to	Unlikely to	Unlikely to	Experience a reduction in manpower
P13	Likely to	Unlikely to	Likely to	Unlikely to	Gain a quick access to information
P14	Likely to	Unlikely to	Likely to	Unlikely to	Make improved decisions
P15	Likely to	Likely to	Likely to	Unlikely to	Experience increased competitive advantage
P16	Likely to	Unlikely to	Likely to	Unlikely to	Experience an increase in market share/ sales
P17	Likely to	Likely to	Likely to	Likely to	Experience an improvement in relationship with partners

Table 3. Motives and Their Underlying Dimensions

Motive	Dimensions	Literature Source	No. of Items
Economic	Efficiency	Mackay and Rosier (1996); Bergeron and Raymond (1992); Lee and Lee (2000)	8
	Effectiveness	Stair.R.M., 1996; and Bergeron and Raymond, 1992	
Fear	Fear of upsetting business partners	Rahim et al., (2002)	6
	Fear of losing business	Dhillon and Caldeira (2000)	
	Fear of not complying with government regulations	Pfeffer and Salancik (1978)	
Status	Enhancing standing of business	Ridgeway and Walker (1995)	5
	Establishing image	Moore and Benbasat (1991)	
Power	Establishing control	Winter (1973)	8
	Discouraging business partners to do business with others	Extended by the researcher based on the works of Webstar (1995)	
	Providing reward or punishment	Molm (1997)	
Imitation	Following IT practice of other businesses which are considered successful	Galaskiewicz and Wasserman (1989)	3
	Following IT practice of rival businesses	Extended by the researcher based on the works of Haunschild and Miner, (1997)	
	Address uncertainty	Perrow (1961)	
Normative	Industry -based practice	DiMaggio and Powell (1983)	3
	Abnormal behaviour		
	Norms of powerful persons working within organizations	Hills (2002)	

Economic Motive. The economic motive refers to the desire of an organisation to introduce IOS in order achieve economic benefits by improving efficiency and effectiveness and can be explained in terms of resources efficiency theory [Schermerhorn, 1975] and competitive economic theory [(Porter and Miller, 1985].

Fear Motive. In contrast, the fear motive refers to the desire of an organisation to adopt IOS because of the perceived fear that non-compliance of IOS adoption is likely to upset the business partner. Fear motives in organisations can be interpreted in terms of resource dependence theory [Peffers et al., 1998].

Institutionalised Norms Motive. This refers to the desire of an organisation to adopt IOS as a result of the influence arising from the cultural beliefs and norms of certain groups of professionals working within an organisation. According to Galaskiewicz and Wasserman [1989], in organisations facing technology adoption decisions, managers may turn to the norms and standards held sacred in their business and professional communities, which eventually motivate them to introduce a new technology (e.g., EDI).

Power Motive. The power motive, on the other hand, refers to the desire of an organisation to adopt IOS in order to control the behaviour of other organisations (e.g., business partners) and can be explained in terms of market power theory [Hymer, 1976].

Imitation Motive. This refers to the desire of an organisation to adopt IOS as a result of the adoption of similar systems by other companies whom they consider to be successful in the industry. The existence of the imitation motive is supported by Simon [1965], who suggested that decision makers facing uncertainty may look for direction from outside their organisational boundaries, and may model themselves on other similar organisations that they perceive to be more successful in their field.

Status Motive This refers to the desire of an organisation to engage in activities to gain respect from others through IOS adoption. This view is consistent with other IT adoption scholars (e.g., Carrol and Delacroix), who suggest that organisations look for opportunities to advance their status, even if temporarily.

The IMM model groups the preceding motives into two broad categories: socio-political and techno-economic. Classifying motives into these two major categories is useful as it highlights the fact that, unlike techno-economic motives, socio-political motives are not intended to gain immediate direct economic benefits. The implication is that the organisations that introduce IOS prompted by techno-economic motives are likely to behave differently from those organisations that introduce IOS inspired by socio-political motives.

5. RESEARCH APPROACH

A rigorous scientific approach was followed in developing and evaluating the instrument. The approach includes a five-stage process that is drawn on the suggestions of several leading case study advocates [e.g., Moore and Benbasat, 1991; Yin, 2003; and Neuman, 2003].

The first stage is concerned with identifying a set of organisational motives relevant for IOS adoption. This was achieved based on a critical review of three streams of literature (i.e., social psychology, organisational science, and IOS/IT on organisational motivations).

The second stage determined a set of dimensions underlying organisational motives for IOS adoption identified in stage one.

In the third stage, a set of items was generated to operationalise those dimensions of motives identified in stage two. A preliminary instrument is then developed based on the generated items.

The fourth stage involves pre-testing this instrument using qualitative feedback received from domain experts. The number of required experts usually depends on how many of them are identified by the researchers; hence, a certain degree of leeway exists in their selection [Kitchenham and Pfleeger, 2002]. In this study, a total of seven domain experts from three universities located in Melbourne were selected. All these experts satisfied the criteria advanced by Kitchenham and Pfleeger [2002] and Grant and Kinney [1992]. These criteria include: (a) the domain experts must hold a Ph.D. qualification or equivalent, (b) they should have knowledge of the subject matter, and (c) they should actively conduct research in the chosen domain (i.e., e-business). The views expressed by the domain experts were analysed in terms of: comprehensiveness of motives, comprehensiveness of items operationalising motives, scale used in measuring items, purpose of the instrument, and appropriateness of section titles. Based on their feedback, a revised instrument was constructed.

The fifth stage is concerned with validity assessment of the pre-tested instrument using feedback received from a group of participants consisting of three academics (who are actively involved in e-business research) and two post-graduate students (having past job experience). These participants were chosen from the IT faculty of a leading Australian university. This stage is performed based on the principles followed by other e-commerce researchers [e.g., Tojib and Sugianto, 2007], and is broadly rooted in the notion of card sort technique [Santos, 2006]. Participants were asked to report feedback in terms of degree of fit of each item to various types of motives on a five-point interval scale:

1 Not at all
2 Very little
3 Somewhat
4 Well
5 Very well

Based on their feedback, a median rating was established for each item. Those items that received a high median rating for only one single motive/locus type were considered *clean items*. The items that received a high median rating for two motive types were considered *partially flawed items*. These items were salvaged in consultation with the participants. On the other hand, those items that received a high median rating for more than two motive types were considered *corrupt items* and hence removed from the instrument. The revised instrument did not include any section titles (showing types of motives). Hence, it was not possible for the participants to indicate the degree of fit for items based on the ideas expressed in section titles. In our previous study [Eklim and Rahim, 2007], we have reported the theoretical deduction of the instrument. This paper presents the findings about the latter stages.

6. PRE-TESTING OF THE PRELIMINARY INSTRUMENT

An analysis was initiated to critically evaluate the views expressed by the domain experts regarding the preliminary instrument.

6.1. Views Expressed by Domain Experts

The following criteria were used: (a) comprehensiveness of motives, (b) comprehensiveness of items operationalising motives, (c) scale used in measuring items, (d) purpose of the instrument, and (e) appropriateness of section titles. Each of these criteria is elaborated in the following sub-sections.

6.1.a. Comprehensiveness of Motives

Out of six types of organisational motives for IOS adoption, three (i.e., economic, status, and normative) received complete agreement from all domain experts. However, some domain experts expressed different views about the naming of "power motive," "fear motive," and "imitation motive." One domain expert (A) argued that power motive is concerned with gaining control and hence suggested renaming "power motive" as "control motive." Two different opinions were expressed regarding "fear motive." One domain expert (E) argued that fear motive is about compliance with the threat coming from influential business partners and hence advised renaming "fear motive" as "compliance motive." Another domain expert (B) viewed "fear motive" and "imitation motive" as motives developed from peer pressure and advised to merge these two motives and use a new label called "peer pressure." It is interesting to note that none of the domain experts suggested any new motive in addition to the six types of motives already identified in the instrument. The overall agreement and disagreement of the domain experts with motives is summarised in Table 4.

Table 4. Number of Domain Experts Expressing Views Concerning Comprehensiveness of Motives

Type of Motive	Agreement with Motives	Disagreement with Motives
Economic	8	0
Power	7	1
Status	8	0
Fear	6	2
Imitation	7	1
Normative	8	0

6.1.b. Comprehensiveness of Items

The comprehensiveness of items operationalising motives are evaluated in terms of: (a) items not clearly stated, (b) number of items irrelevant to the motive, (c) number of redundant items, and (d) number of additional items. The number of suggestions offered by the domain experts in regard to the comprehensiveness of items is summarised in Table 5.

Table 5. Number of Suggestions Concerning the Comprehensiveness of Items

Domain Experts	Type of Suggestions			
	Items Not Clearly Stated	Number of Items Irrelevant to the Motive	Number of Redundant Items	Number of Suggested Additional Items
A	3	0	1	1
B	1	0	0	2
C	0	0	0	1
D	18	0	5	0
E	10	10	2	1
F	9	0	0	0
G	14	0	0	0
Total	55	10	8	5

It can be seen from Table 5 that most of the comments concern the clarity of items. A total of 55 suggestions were offered to improve clarity of the instrument. Domain experts suggested three types of changes regarding the clarity of items.

First, some items were required to refer to plural nouns. For example, Item 2, which was stated as "The desire to reduce manpower *cost* has motivated my company to adopt IOS," was rephrased as "The desire to reduce manpower *costs* has motivated my company to adopt IOS."

Second, some of the items had a missing article. For example, Item 17, which was stated as "The desire to establish innovative image has motivated my company to adopt IOS," was rephrased as "The desire to establish *an* innovative image has motivated my company to adopt IOS."

Third, some of the items required minor rewording and simplification. For example, Item 12, which was stated as "The desire *for not loosing* key business partners (e.g., supplier, customer) has motivated my company to adopt IOS," was rephrased as "The desire *to retain* key business partners (e.g., supplier, customer) has motivated my company to adopt IOS."

A total of 10 items were regarded irrelevant to the motives. One domain expert (E) indicated that all the 8 items used for measuring "economic motive" do not reflect the notion underlying economic motive. According to that domain expert, economic motive should indicate success of organisation and increased effectiveness of organisation as a result of IOS adoption. The same domain expert also considered that Items 29 and 30 do not reflect imitation motive; rather, they represent fear motive.

A total of 8 items were considered redundant. One domain expert (A) viewed that Item 21, which is "The desire to persuade our business partners to follow the business rules set by us has motivated my company to adopt IOS," and Item 22, which is "The desire to discourage our business partners from questioning our business rules has motivated my company to adopt IOS," are closely related and suggested that we rephrase or remove Item 22, as it is closely related to Item 21. Another domain expert (D) viewed that Item 9, which is "The desire for not frustrating our business partners has motivated my company to adopt IOS," Item 10, which is "The desire to make our business partners happy has motivated my company to adopt IOS," and Item 11, which is "The fear of harming existing relationships with business partners has motivated my company to adopt IOS," reflect the same concept. Domain expert (D) commented that not frustrating business partners leads to making business partners happy. In the same way, fear of harming existing relationship leads to the fear of making business partners unhappy. As such, domain expert (D) suggested creating one item combining Items 9, 10 and 11. The same domain expert (D) also viewed that Item 31, which is "Use of IOS is considered a standard practice in the industry we operate, and hence the desire of having an accepted industry practice has motivated my company to adopt IOS," and Item 32, which is "My company adopted IOS because not having it will be considered as an abnormal practice by

other companies operating in our industry," reflect the same concept as violation of standard practice is considered as abnormal practice and suggested to combine those items into one. Another domain expert (E) viewed Item 37, which is "My company can be regarded as the leader of IOS in our industry," and Item 38, which is "We have set IOS adoption pace in our industry' reflect the same concept, since "leader of IOS," means adopting IOS prior to rival companies. Hence, domain expert (E) suggested merging those two items into one.

Domain experts also advised the inclusion of five new items in the instrument. Domain expert A suggested a new item for the normative motive because none of the existing items is related to the pressure exercised by large trading partners. According to domain expert A, the new item is "My company desired to adopt IOS as it is mandated by powerful and influential trading partners." Domain expert B suggested two new items as none of the items in the instrument reflect achieving faster response time and maintaining the momentum of workflow. As such, those items are "The desire to achieve faster response time has motivated my company to adopt IOS." and "The desire to maintain the momentum of workflow has motivated my company to adopt IOS." Domain expert C suggested a new item as none of the items in the instrument reflect the advantage of fast-movers. Hence, the new item is "The desire to gain first-mover advantage has motivated my company to adopt IOS." Domain expert 'E' also suggested a new item as none of the items reflected the initiative to adopt IOS originating from the grassroots level. Hence, the new item is "The IOS adoption was the outcome of initiative originated from our company's grass-root level."

6.1.c. through e. Scale Used in Measuring Items, Purpose of the Instrument, and Appropriateness of Section Titles

Three domain experts (A, B, and C) favoured the use of a five-point interval scale for measuring items included in the instrument. They explained that it would be hard for the IS/IT managers to select an appropriate rating from the seven-point scale. On the matter of font used in the instrument, all domain experts expressed satisfaction. Furthermore, all domain experts were also satisfied with the explanation given in the purpose of the instrument and section titles used in the instrument.

6.2. Improving the Preliminary Instrument

One domain expert (A) argued that power motive is concerned with gaining control and hence suggested that we rename "power motive" as "control motive." However, "power motive" refers to the desire of an organisation to exert influence over other business partners [Winter, 1973]. Table 1, earlier, indicates that "establishing control" is a sub-construct of "power motive." "Power motive" was considered as the desire to exert influence, which, in turn, provides control over business partners. As such, "power motive" is not renamed as "control motive."

One domain expert (E) argued that fear motive is about compliance with the threat arising from influential business partners and hence advised the researcher to rename "fear motive" as "compliance motive." Table 1 indicates that "fear motive" refers to the desire of an organisation to adopt IOS with a perceived fear that non-adoption may bring a loss in the business in the form of losing business partners, upsetting business partners, and facing future litigation from business partners or government bodies. It is clear from the definition that, as a result of perceived fear, compliance occurs. In other words, if there is no perceived fear, compliance may not occur. As such, "fear motive" is not renamed as "compliance motive." Another domain expert (B) viewed "fear motive" and "imitation motive" as motives developed from peer pressure and advised to merge these two motives and use a new label called "peer pressure." It is argued that "fear motive" is distinctly different from "imitation motive" and hence these two motives are not merged. On the question of "imitation motive," it is argued that imitation takes place when an organisation is following the IT practice of other businesses that are considered successful or following the IT practice of rival businesses. Imitation thus may occur without peer pressure. As such, "imitation motive" is not renamed as "peer pressure."

6.3. Responses for Comprehensiveness of Items

Domain experts suggested three types of changes in regard to clarity. All their suggestions were incorporated. First, some items were required to refer to plural nouns. For example, in Items 2, 3, and 4 the word *cost* is replaced by *costs.* Likewise, in Items 24 and 25, the word *reward* is replaced by *rewards,* and in Items 26 and 27, the word *threat* is replaced by *threats.* Second, some items had a missing article. For example, the article *an* is added to Items 17, and the article *the* is added to Items 30 and 40. Third, some items required minor rewording and simplification. For instance, Item 12, which was stated as "The desire *for not losing* key business partners (e.g., supplier, customer) has motivated my company to adopt IOS," is now expressed as "The desire *to retain* key business partners (e.g., supplier, customer) has motivated my company to adopt IOS." The amended items are shown in Table 6.

Table 6. List of Amended Items

Item #	Description of Amended Items	Type of change Incorporated
2	The desire to reduce manpower *costs* has motivated my company to adopt IOS.	Use of plural nouns (‘Cost’ is replaced by ‘costs.”)
3	The desire to reduce inventory *costs* has motivated my company to adopt IOS.	Use of plural nouns (The word ‘cost’ is replaced by costs.’)
4	The desire to reduce paper *costs* has motivated my company to adopt IOS.	Use of plural nouns (The word ‘cost’ is replaced by ‘costs.’)
6	The desire to improve the ability *to make* decisions has motivated my company to adopt IOS.	Minor rewording
11	The *desire to maintain* existing relationships with business partners has motivated my company to adopt IOS.	Minor rewording
12	The desire *to retain* key business partners (e.g. supplier, customer) has motivated my company to adopt IOS.	Minor rewording
17	The desire to establish *an* innovative image has motivated my company to adopt IOS.	Adding article ‘an’
20	The desire *to weaken* the bargaining capacity of our business partners has motivated my company to adopt IOS.	Minor rewording
24	The desire to encourage our business partners to trade with us electronically, by highlighting the possible *rewards* of receiving our products/services delivered at a lower price, has motivated my company to adopt IOS.	Minor rewording
25	The desire to encourage our business partners to trade with us electronically, by highlighting the possible *rewards* of receiving ‘preferred business partner status’, has motivated my company to adopt IOS.	Minor rewording
26	The desire to persuade our business partners to trade with us electronically, by highlighting the possible *threats* of discontinuing existing business relationships, has encouraged my company to adopt IOS.	Use of plural nouns (The word ‘threat*’* is replaced by threats.)

Table 6. List of Amended Items *(Continued)*

Item #	Description of Amended Items	Type of change Incorporated
27	The desire *to persuade* our business partners to trade with us electronically, by highlighting the possible *threats* of not expanding existing business relationships, has encouraged my company to adopt IOS.	Minor rewording and use of plural nouns (The word 'threat*'* is replaced by 'threats*.'*)
30	The desire to address uncertainty in *the* business environment through establishing electronic linkages with business partners has motivated my company to adopt IOS.	Adding article 'the'
31	Use of IOS is considered a standard practice in the industry *in which* we operate, and hence the desire of having an accepted industry practice has motivated my company to adopt IOS.	Minor rewording
40	The initiative to adopt IOS originated from *the* industry association.	Adding article 'the'

Domain experts identified 10 items that are not related to any motives included in the instrument. For instance, one domain expert (E) did not agree with the definition of "economic motive" and hence regarded all 8 items used for measuring "economic motive" to be irrelevant. According to this expert, "economic motive" represents success of the organisation and increased efficiency. However, efficiency and effectiveness are considered as sub-constructs of "economic motive." Success of the organisation was not considered as "economic motive." It is therefore argued that efficiency and effectiveness together successfully measure "economic motive." Hence, the views expressed by domain expert E are disregarded.

The same domain expert (E) also considered that Item 29, which is "The desire of not staying behind our rival companies, which also use IOS, has motivated my company to adopt IOS," and Item 30, which is "The desire to address uncertainty in business environment through establishing electronic linkage with business partners has motivated my company to adopt IOS," are inadequate to reflect "imitation motive"; rather, they represent "fear motive." The opinions of the domain expert (E) were disregarded because it is argued that Item 29 represents the desire of organisations for not lagging behind their competitors. Hence, it represents a genuine dimension of "imitation motive." Likewise, Item 30, which is concerned with "the imitation motive of organisations in an uncertain situation" is retained.

Domain experts considered eight items to be redundant. Four of these (Items 9, 22, 32, and 38) have been removed. One domain expert (D) suggested that Item 9, which is "The desire for not frustrating our business partners has motivated my company to adopt IOS," Item 10, which is "The desire to make our business partners happy has motivated my company to adopt IOS," and Item 11, which is "The fear of harming existing relationships with business partners has motivated my company to adopt IOS," reflect the same issue. Based on this suggestion, Item 9 is removed from the instrument, Item10 remains as it is, and Item 11 is rephrased. Another domain expert (A) viewed that Item 21, which is "The desire to persuade our business partners to follow the business rules set by us has motivated my company to adopt IOS," and Item 22, which is "The desire to discourage our business partners from questioning our business rules has motivated my company to adopt IOS," are closely related and suggested to remove Item 22. Based on this suggestion, Item 22 is omitted from the instrument. The domain expert (D) also viewed that Item 31, which is "Use of IOS is considered a standard practice in the industry we operate, and hence the desire of having an accepted industry practice has motivated my company to adopt IOS," and Item 32, which is "My company adopted IOS because not having it will be considered as an abnormal practice by other companies operating in our industry," refer to the same issue, and hence suggested that we combine those items into one. Based on this suggestion, Item 32 was omitted. Another domain expert (E) viewed Item 37, which is 'My company can be regarded as the leader of IOS in our industry," and Item 38, which is "We have set IOS adoption pace in our industry," reflect the same issue as "leader of IOS" means adopting IOS prior to rival companies. Based on this suggestion, Item 38 is omitted.

Domain experts also advised the inclusion of five new items in the instrument. Three of these are incorporated in the revised instrument. Domain expert A suggested a new item for the "normative motive" because none of the existing items is related to the pressure exercised by large trading partners. According to domain expert A, the new item can be expressed as "My company desired to adopt IOS as it is mandated by powerful and influential trading partners." This item, however, cannot be incorporated because a number of items (i.e., Items 25, 26, 27, and 28) already exist within the "power motive," which represents the same concept. Domain expert B suggested two new items: achieving faster response time and maintaining momentum of workflow. The suggestion about "Achieving faster response time" is considered as the same concept that is highlighted by Item 5, which is "The desire to reduce transaction processing time has motivated my company to adopt IOS," and hence was not included in the instrument. Another item about "Maintaining momentum of workflow" is included in the instrument as a new item for representing the efficiency dimension of "economic motive." Domain expert C also suggested a new item about the "advantage of fast-movers," which is not represented by any

of the existing items in the instrument. Hence, the new item, "The desire to gain first-mover advantage has motivated my company to adopt IOS," is incorporated in the instrument which represents "economic motive." Domain expert E also suggested a new item as none of the items reflected the initiative to adopt IOS originating from the "grass- root level." Hence, the new item, "The IOS adoption was the outcome of initiative originated from our company's grass-root level," is incorporated in the instrument to represent the "locus of motive." In summary, the new items that are included in the instrument are shown in Table 7.

Table 7. New Items Added to the Instrument

Item Number	Item Description	Type and Locus of Motive
9	The desire to gain first-mover advantage has motivated my company to adopt IOS.	Economic
10	The desire to maintain the momentum of work-flow has motivated my company to adopt IOS.	Economic
38	The IOS adoption was the outcome of initiative originated from our company's grass-root level.	Locus of motive

Based on the views of the domain experts, a five-point scale was considered to be appropriate. As such, a five-point scale has been accepted. In summary, the revised instrument contains a total of 32 items operationalising various types of motives for IOS adoption and another 9 items which operationalise locus of motives.

7. MOTIVATION INSTRUMENT VALIDITY ASSESSMENT

Validity of the revised instrument was assessed using a qualitative technique based on the responses received from five participants. The empirical ratings received from the participants were carefully examined, and both *clean* and *corrupt* items were identified, based on a set of criteria. The principles used in the assessment process are consistent with those followed by Tojib and Sugianto [2007].

7.1. Rating of Items by Type of Motive

The median of ratings received by each item is shown in Table 8. For the sake of clarity, the median rating of 2 or less is not shown.

Table 8. Median of Items Measuring IOS Adoption Motive Types (Based on Revised Instrument)

Item Description	Motive Types						Remarks
	E	F	S	P	I	N	
1. The desire to reduce data entry errors has motivated my company to adopt IOS	5						Clean item
2. The desire to reduce manpower costs has motivated my company to adopt IOS	5						Clean item
3. The desire to reduce inventory costs has motivated my company to adopt IOS	5						Clean item
4. The desire to reduce paper costs has motivated my company to adopt IOS	5						Clean item
5. The desire to reduce transaction processing time has motivated my company to adopt IOS	5						Clean item
6. The desire to improve the ability to make decisions has motivated my company to adopt IOS	4						Clean item
7. The desire to establish a strong link between business partners (e.g. suppliers, customers) has motivated my company to adopt IOS	4	3	3	3		3	Corrupt item (Removed)
8. The desire to lock in our business partners has motivated my company to adopt IOS	5			3			Partially flawed item
9. The desire to gain first-mover advantage has motivated my company to adopt IOS	4		3	3			Corrupt item (Removed)
10. The desire to maintain the momentum of work-flow has motivated my company to adopt IOS	4						Clean item
11. The desire to make our business partners happy has motivated my company to adopt IOS		4					Clean item
12. The desire to maintain existing relationships with business partners has motivated my company to adopt IOS	3	4					Partially flawed item
13. The desire to retain key business partners (e.g. supplier, customer) has motivated my company to adopt IOS	3	4		3			Corrupt item (Removed)
14. The desire to avoid possible sanctions from government for not complying with government regulations has motivated my company to adopt IOS		5					Clean item
15. The desire to avoid possible litigation has motivated my company to adopt IOS		5					Clean item
16. The desire to gain respect from business partners (e.g. customer, supplier) has motivated my company to adopt IOS			5				Clean item
17. The desire to gain respect from rival companies has motivated my company to adopt IOS			5				Clean item
18. The desire to establish an innovative image has motivated my company to adopt IOS			5				Clean item

NOTE: E denotes Economic; F denotes Fear; S denotes Status; P denotes Power; I denotes Imitation; and N denotes Normative.

Table 8. Median of Items Measuring IOS Adoption Motive Types
(Continued)

Item Description	E	F	S	P	I	N	Remarks
19. The desire to establish a caring business partner image (e.g., customer, supplier) has motivated my company to adopt IOS .			5				Clean item
20. The desire to increase employees' positive thinking about our company has motivated my company to adopt IOS.			5				Clean item
21. The desire to weaken bargaining capacity of our business partners has motivated my company to adopt IOS to adopt IOS				5			Clean item
22. The desire to persuade our business partners to follow our business rules has motivated my company to adopt IOS.				5			Clean item
23. The desire to prevent business partners from doing business with our rival companies has motivated by company to adopt IOS.				4			Clean item
24. The desire to encourage business partners to trade with us electronically, by highlighting the possible rewards of receiving our products/services delivered at a lower price, has motivated my company to adopt IOS.	3			4			Partially flawed item
25. The desire to encourage our business partners to trade with us electronically, by highlighting the possible rewards of receiving "preferred business partner status," has motivated my company to adopt IOS.	3			3			Partially flawed item
26. The desire to persuade our business partners to trade with us electronically, by highlighting the possible threat of discontinuing existing business relationships, has encouraged my company to adopt IOS.				5			Clean item
27. The desire to persuade our business partners to trade with us electronically, by highlighting the possible threat of our expanding existing business relationships, has encouraged my company to adopt IOS.				5			Clean item
28. The desire to follow other successful companies that are using IOS has motivated my company to adopt IOS.					5		Clean item
29. The desire of not staying behind our rival companies, which also use IOS, has motivated my company to adopt IOS.					5		Clean item
30. The desire to address uncertainty in the business environment through establishing electronic linkage with business partners has motivated my company to adopt IOS.	3	3				3	Corrupt item (removed)

NOTE: E denotes Economic; F denotes Fear; S denotes Status; P denotes Power; I denotes Imitation; and N denotes Normative.

Table 8. Median of Items Measuring IOS Adoption Motive Types
(Continued)

Item Description	E	F	S	P	I	N	Remarks
31. Use of IOS is considered a standard practice in the industry in which we operate, and hence the desire of having an accepted industry practice has motivated my company to adopt IOS.						4	Clean item
32. The desire to support the work practice of influential managers (e.g., supply chain managers, IT managers, senior managers) has motivated my company to adopt IOS.						5	Clean item

NOTE: E denotes Economic; F denotes Fear; S denotes Status; P denotes Power; I denotes Imitation; and N denotes Normative.

From Table 8, the following observations can be made.

- First, out of 32 items, a total of 24 (i.e., Items 1 to 6, 10 to 11, 14 to 23, 26 to 29, and 31 to 32) received a high median rating for a single type of motive. For example, Item 1, "The desire to reduce data entry errors has motivated my company to adopt IOS," received a median rating of 5 for Economic motive (E) only. These are called *clean items* because each distinctly identifies only one type of motive.

- Second, a total of four items (i.e., Items 8, 12, 24, and 25) received a high median rating for two types of motives. For example, Item 8, "The desire to lock in our business partners has motivated my company to adopt IOS," received a median rating of 5 for Economic motive and another median rating of 3 for Power motive (P). These items are called *partially flawed* because each distinctly identifies two types of motives. The presence of a high median rating for two motive types indicates that the items contain elements that are interpreted by the participants in two different ways. It is possible to salvage these items by removing the ambiguity present in the item. This can be done by rephrasing the item in consultation with the participants. Once the ambiguity is identified and removed, these *partially flawed* items could be converted to *clean items*.

- Third, a total of four items (i.e., Items 7, 9, 13, and 30) received high median rating for more than two types of motives. For example, Item 7, "The desire to establish a strong link between business partners (e.g., suppliers, customers) has motivated my company to adopt IOS," received a median rating of 4 for Economic motive, and another median rating of 3 for Fear motive, Status motive, Power motive, and Normative motive. These items are called *corrupt items*. These items are unsalvageable because they are likely to contain elements that were interpreted by participants along multiple directions. Consequently, it is

not possible to rescue them. Hence, they are eliminated from the instrument.

7.2. Rating of Items by Locus of Motive

The median of ratings received by all nine items for measuring locus of motive are shown in Table 9. As indicated, all but one of the nine received a high median rating for either internal or external locus of motive. Only Item 36, "My company can be regarded as the leader of IOS in our industry," received a high median rating for both internal and external locus of motive. Hence, this is considered a *corrupt item* and is removed from the instrument.

Table 9. Median of Items Rating into Locus of Motives

Item No. Item Description	Locus of Motive	
	Internal	**External**
33. The initiative to adopt IOS originated from the senior management of my company.	5	
34. The initiative to adopt IOS originated from the functional managers (e.g. IT managers, supply chain managers) of my company.	5	
35. My company invested in IOS voluntarily.	5	
36. My company can be regarded as the leader of IOS in our industry.	3	3
37. The IOS adoption was the outcome of initiative originated from our company's grass-root level.	5	
38. The initiative to adopt IOS originated from an important business partner (e.g. customer, supplier).		4
39. The initiative to adopt IOS originated from the industry association.		5
40. The initiative to adopt IOS originated from government bodies.		5
41. The initiative to adopt IOS originated from third party IT vendors.		4

7.3. Improving *Partially Flawed* Items

The four items (i.e., Items 8, 12, 24, and 25) that received a high median rating for two types of motives (discussed earlier) were carefully scrutinized to find out exactly what led the participants to categorise those items under two different motives. A discussion was again held with the participants and, based on their feedback, these four items were revised. The revised versions of these items, shown in Table 10, were given to the participants for rating. The median rating of the revised items are also shown in Table 10, which clearly indicates

that each of these item is now associated with one type of motive. Therefore, they are now considered *clean items*.

Table 10. New Rating of Salvaged Items

Item Description	Motive Types					
	E	**F**	**S**	**P**	**I**	**N**
8. The desire to lock in our business partners for gaining economic advantage has motivated my company to adopt IOS.	4					
12. The desire of not harming existing relationships with business partners has motivated my company to adopt IOS.		4				
24. The desire to establish our authority over our business partners to trade with us electronically, by highlighting the possible rewards of receiving our products/services delivered at a lower price, has motivated my company to adopt IOS.				5		
25. The desire to establish our authority over our business partners to trade with us electronically, by highlighting the possible rewards of receiving 'preferred business partner treatment', has motivated my company to adopt IOS.				5		

NOTE: E denotes Economic; F denotes Fear; S denotes Status; P denotes Power; I denotes Imitation; and N denotes Normative.

7.4. Validity of Items

After the *partially flawed* items are salvaged, the revised instrument now includes 28 *clean items* for operationalizing six types of motives, and eight more *clean items* for operationalizing locus of motive. These *clean items* are now examined to determine if each of them is associated with the theoretically predicted motive type. In other words, comparisons are made to find out whether each item is associated with the motive type that is identical to what was predicted, based on a review of literature. This is shown in Table 10. For example, Item 8, "The desire to lock in our business partners for gaining economic advantage has motivated my company to adopt IOS," was expected to reflect a characteristic of the Economic motive type. The empirical evaluation of the item by the participants confirms this association. Likewise, Item 12 confirms the association of the item to the Fear motive, and Items 24 and 25 confirm the association of the items to the Power motive. (A critical look at Table 12 reveals that all the items are associated highly with motive types that are identical to what was predicted, based on a review of literature. Hence, these items are valid.)

8. DISCUSSION

To measure the motives for IOS adoption, we initially developed a theory-driven preliminary instrument that included 42 items. Of these, 33 represented various dimensions of six broad types of motive. The remaining nine represent locus of motive. The preliminary instrument was then pre-tested, using feedback from several domain experts. Based on their feedback, 15 items were rephrased for clarity purposes, four were removed, and three new items were added to the instrument. Hence, the pre-tested instrument contained 41 items. The pre-tested instrument was then given to a group of academics and post-graduate students for validity assessment during which several more items were removed. The validated instrument thus contained 36 items. The number of items appearing in the instrument at each stage is shown in Table 11.

Table 11. Number of Items Appearing in the Instruments at Different Stages

Stage	Deliverable	Total Number of Items
Critical literature review	Preliminary instrument	42
Pre-testing	Revised instrument	41
Validity assessment	Validated instrument	36

Table 12 presents the association of *clean* item to motive types, based on the revised instrument.

The preliminary instrument contained a total of 33 items that operationalize six types of motives. However, the instrument does not use the same number of items for operationalizing each of the six types of motives. The sub-constructs of Economic motive and Power motive provide more items (8 items) to operationalize those two types of motives, in comparison with other types of motives. During the pre-testing stage, two new items were added to economic motive, and one item was removed from Fear motive, Power motive, and Normative motive, respectively. The pre-tested instrument was then subject to validity assessment by a group of participants. Based on the validation process, four more items were removed, and another four items were revised in consultation with the participants. Therefore, the validated instrument contained 28 items. The total number of items at each stage is shown in Table 13.

Table 12. Association of *Clean* Items to Motive Types (Based on Revised Instrument)

Item Description	Theoretically Derived Motive	Empirically Supported Motive	Related Empirical Rating
1. The desire to reduce data entry errors has motivated my company to adopt IOS.	Economic	Economic	5
2. The desire to reduce manpower costs has motivated my company to adopt IOS.	Economic	Economic	5
3. The desire to reduce inventory costs has motivated my company to adopt IOS.	Economic	Economic	5
4. The desire to reduce paper costs has motivated my company to adopt IOS.	Economic	Economic	5
5. The desire to reduce transaction processing time has motivated my company to adopt IOS.	Economic	Economic	5
6. The desire to improve the ability to make decisions has motivated my company to adopt IOS.	Economic	Economic	4
8. The desire to lock in our business partners for gaining economic advantage has motivated my company to adopt IOS.	Economic	Economic	4
10. The desire to maintain the momentum of work-flow has motivated my company to adopt IOS.	Economic	Economic	4
11. The desire to make our business partners happy has motivated my company to adopt IOS.	Fear	Fear	4
12. The desire of not harming existing relationships with business partners has motivated my company to adopt IOS.	Fear	Fear	4
14. The desire to avoid sanctions from government for not complying with government regulations has motivated my company to adopt IOS	Fear	Fear	5
15. The desire to avoid possible litigation has motivated my company to adopt IOS.	Fear	Fear	5
16. The desire to gain respect from business partners (e.g. customer, supplier) has motivated my company to adopt IOS.	Status	Status	5
17. The desire to gain respect from rival companies has motivated my company to adopt IOS.	Status	Status	5
18. The desire to establish an innovative image has motivated my company to adopt IOS.	Status	Status	5
19. The desire to establish a caring business partner image has motivated my company to adopt IOS.	Status	Status	5
20. The desire to increase employees' positive thinking about our company has motivated my company to adopt IOS.	Status	Status	5
21. The desire to weaken the bargaining capacity of our business partners has motivated my company to adopt IOS.	Power	Power	5

Table 12. Association of Clean Items to Motive Types (Based on Revised Instrument)
(Continued)

Item Description	Theoretically Derived Motive	Empirically Supported Motive	Related Empirical Rating
22. The desire to persuade our business partners to follow our business rules has motivated my company to adopt IOS.	Power	Power	5
23. The desire to prevent business partners from doing business with our rival companies has motivated my company to adopt IOS.	Power	Power	4
24. The desire to establish our authority over our business partners to trade with us electronically, by highlighting the possible reward of receiving our products/services delivered at a lower price, has motivated my company to adopt IOS .	Power	Power	5
25. The desire to establish our authority over our business partners to trade with us electronically, by highlighting the possible reward of receiving 'preferred business partner treatment', has motivated my company to adopt IOS .	Power	Power	5
26. The desire to persuade our business partners to trade with us electronically, by highlighting the possible threat of discontinuing existing business relationships, has encouraged my company to adopt IOS.	Power	Power	5
27. The desire to persuade our business partners to trade with us electronically, by highlighting the possible threat of not expanding existing business relationships, has encouraged my company to adopt IOS.	Power	Power	5
28. The desire to follow other successful companies which are using IOS has motivated our company to adopt IOS.	Imitation	Imitation	5
29. The desire of not staying behind our rival companies, which also use IOS, has motivated my company to adopt IOS.	Imitation	Imitation	5
31. Use of IOS is considered a standard practice in the industry in which we operate, and hence the desire of having an accepted industry practice has motivated my company to adopt IOS.	Normative	Normative	4
32. The desire to support the work practice of influential managers (e.g. supply chain managers, IT managers, senior managers) has motivated my company to adopt IOS.	Normative	Normative	5

Item Description	Theoretically Derived Motive	Empirically Supported Motive	Related Empirical Rating
33. The initiative to adopt IOS originated from the senior management of my company.	Internal	Internal	5
34. The initiative to adopt IOS originated from the functional managers (e.g. IT managers, supply chain managers) of my company.	Internal	Internal	5
35. My company invested in IOS voluntarily	Internal	Internal	5
36. The IOS adoption was the outcome of initiative originated from our company's grass-root level.	Internal	Internal	5
37. The initiative to adopt IOS originated from an important business partner (e.g. customer, supplier).	External	External	4
38. The initiative to adopt IOS originated from the industry association.	External	External	5
39. The initiative to adopt IOS originated from government bodies.	External	External	5
40. The initiative to adopt IOS originated from third party IT vendors.	External	External	4

Table 13. Total Number of Items for Motive Types at Different Stages

Stages	Deliverable	E	F	S	P	I	N	Total Number of Items
Critical literature review	Preliminary instrument	8	6	5	8	3	3	33
Pre-testing	Revised instrument	10	5	5	7	3	2	32
Validation	Validated instrument	8	4	5	7	2	2	28

NOTE: E denotes Economic motive; F denotes Fear motive; S denotes Status motive; P denotes Power motive; I denotes Imitation motive; and N denotes Normative motive.

Based on a critical review of literature, a total of nine items were identified for operationalizing locus of motive, which appears in the preliminary instrument. During the pre-testing stage, one item was removed from internal locus of motive and another new item was added to the instrument, which also represents internal locus of motive. Hence, a total of nine items remained in the pre-tested instrument. During the validation stage, one more item was removed from internal locus of motive, leaving a total of eight items in the validated instrument. The number of items for locus of motive during the three stages is shown in Table 14.

Table 14. Total Number of Items for Locus Types at Different Stages

Stage	Deliverable	Internal Locus	External Locus	Total Items
Critical literature review	Preliminary instrument	5	4	9
Pre-testing	Revised instrument	5	4	9
Validation	Valid instrument	4	4	8

9. CONCLUSION

Measuring organisational motives for IOS adoption is important because, once motivations for IOS adoption are known, an improved understanding can be developed about IOS introduction practices and resulting outcomes. Unfortunately, very little work has been reported in this regard. An exception is the work of Rahim et al. [2007], who proposed the IOS adoption motivation model (IMM). The applicability of the model, however, has not been thoroughly tested. Current studies involving a preliminary evaluation of this model are case study-based; hence, their findings cannot be generalised.

The project reported in this paper aims to extend the IMM model by developing and validating a theory-driven instrument, which would operationalise different types of organisational motives for IOS adoption. The instrument is useful to e-commerce researchers because it enables the establishment of statistical generalisibility of the IMM proposed by Rahim et al. [2006; 2007]. The instrument is also important to e-commerce practitioners because it forces them to think and articulate clearly the motive of their organisations for introducing IOS with supply-chain partners. A clear articulation of motives is important for establishing a causal relationship between IOS adoption process and the organisational motive for IOS adoption.

This research has some limitations.

First, a group of post-graduate students with some past job experience was invited to evaluate the instrument at the instrument validity assessment stage. In real life settings, e-commerce/IT managers are likely to have far greater experience than those students. Hence, the feedback received from the students may not represent the maturity of e-commerce/IT managers. Consequently, the opportunities for identifying some new dimensions of various types of motive may have been lost. Additional research is thus needed to test the instrument using feedback received from experienced IS managers.

Second, the instrument is developed for the supply-chain-oriented IOS. Hence, the items in the instrument may not describe the context for operationalizing other varieties of IOS.

Third, a quantitative, rigorous statistical validation process was not followed. Further work is required to validate the instrument using statistical analysis (e.g.,factor analysis).

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