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# Modeling Organizational Virtualness in the Airline Industry An Empirical Investigation

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## ABSTRACT

In an era of rapid technological innovation, conducting business is no longer solely reliant upon traditional boundaries and conventional communication patterns. Organizations may make use of ICT, collaborative ventures, and digitized business environments. Consequently, researchers and practitioners are increasingly concerned with understanding what characteristics are necessary to succeed as a virtual organization. In contributing to the understanding of these contemporary aspects of modern business, this study employs an existing but untested model, and extends it by including the concept of trust. The resulting model was empirically examined using responses from 202 staff members at a leading international airline who routinely come into contact with the technology-dependent elements of the organization. Results of the data analysis generally support the structure of the model. However, it is acknowledged that the results obtained may be specific to the industry in which the study took place, and therefore additional investigation in alternative settings is required.

## Keywords (Required)

Virtual organization, ICT dependency, empirical study.

## INTRODUCTION

In recent years there has been a rapid move towards a more technologically based society. This has consequently resulted in technology-mediated activity gaining greater credence and becoming more commonplace among both researchers and professionals alike (Piris et al 2004). Increasingly, organizations look toward technology in order to modify themselves so that they can meet market demands and effectively develop their skills and knowledge base (Saabeel et al 2002, Bauer and Koszegi 2003). This increasing trend toward organizational virtuality has in turn spurred an exponential growth in research relating to the characteristics, drivers, and enablers of different levels of dependency on information and communication technologies (ICT). Such dependency is often referred to in the literature as the level of *organizational virtualness* - see for instance Bauer and Koszegi (2003), Griffith et al (2003). Organizational virtualness can be defined using a variety of means ranging from the extent to which collaboration technologies exist within an organization, to the use of formulae to calculate varying dimensions of virtualness according to reliance on ICT (Chinowsky and Rojas 2003, Griffith et al 2003).

Travica's (2005) ISSAAC model (an acronym for the constructs of the model: interoperability, switching, special product, aggregation, anchoring and cybernization) attempts to combine the most common characteristics associated with the virtual organization into a single model, which can then be used to explain both the concept of the virtual organization, and assess the overall degree of virtualness within an organization. Although ISSAAC is grounded in the extant literature associated with the increased dependence of organizations on ICT, it has two key limitations. First, its constituent constructs are derived from only one example of organizational virtualness, and second, it currently lacks quantitative validation. This reduces not only the generalizability of the model in assessing all types of organizational virtualness, but also gives no indication as to the validity or interdependency of the constructs.

This study examines the common characteristics associated with the two most widespread manifestations of virtuality within the marketplace; the virtual organization and virtual team (Barnes and Hunt 2001, Saabeel et al 2002, Dushnitsky 2004). This has been done with the aim of both, adding support to Travica's (2005) existing model, and identifying additional

characteristics, that may both supplement ISSAAC's ability to assess virtuality in organizations and create a wider ranging and more robust model. A survey was developed and tested, hypotheses relating to the structure of the model postulated and the resulting model quantitatively tested in the field, thereby, empirically validating the model, and allowing for the identification of the most pertinent relationships associated with ISSAAC.

The remainder of the paper is organized as follows. First, we review the constructs of the model and examine their foundations in the literature. Second, we present our extended model and associated hypotheses, and the research method employed. Third, we present our results and a discussion of their implications, and finally, we assess the limitations of this study and present areas requiring further investigation.

## **BACKGROUND**

According to Travica (2005), seven constructs characterize virtual organizations: *Interoperability (technical and social)*, *switching*, *special product*, *aggregation*, *anchoring* and *cybernization*. However, the extant literature suggests that the additional construct of *trust* is also closely associated with virtual organizations and teams (see for example, Gallivan and Depledge, 2003 and Jarvenpaa and Leiner, 1999). As a result, we argue that the concept of trust should be incorporated into Travica's (2005) model. Of the (now) eight constructs, we theorize that two are exogenous (trust and anchoring), and the remainder are dependant and therefore endogenous. The following section defines each construct and identifies their theoretical roots.

### **Interoperability**

The role of interoperability within virtual forms is three-fold. Firstly, it deals with the use of suitable ICT platforms, well-matched ICT standards, and systems and software - collectively referred to as the development of technical interoperability. Secondly, it deals with creating a sense of compatibility through means not primarily dependant on ICT. For example, via job-role competencies, like values and shared strategic goals. Together these two factors represent the ability of the virtual unit to create a synchronized group of partners who are able to share skills and build a common vocabulary with the aim of fulfilling a particular niche in the marketplace (Gibson and Cohen, 2003, Gottfredson et al, 2005, Travica, 2005).

### **Switching**

Switching is defined as the degree to which members of virtual organizations can alternate their membership of virtual alliances dependant upon their needs at any given time (Introna, 2001, Travica, 2005). An essential element of switching is the level of heterogeneity within an organization - the degree to which members of an organization or team have a diverse set of skills that are interchangeable among partners (Brennan and Braswell, 2005). Essentially, the presence of heterogeneity helps to create a balance between both unique and transposable skills. Overall, this creates the competitive advantage necessary to thrive in a dynamic and hyper-competitive market (Gottfredson et al, 2005).

### **Special Product**

The concept of special product is concerned with the ability of forms such as the virtual organization or team to create products or services that are both atypical in nature and in the manner in which they are produced (Chidambaram and Bostrom, 1993, Travica, 2005). According to Hale and Whitman (1997), producing a customized or niche product is one of the reasons why the virtual form is seen as a threat to more traditional organizations of the past. Therefore, if organizations operating along the continuum of virtuality wish to succeed, they must not only adapt their structure and working practices, but also their end goals and the way they respond to the marketplace.

### **Aggregation**

Aggregation focuses on the degree to which individuals come together through electronic networking in order to overcome barriers of time and space (Gibson and Cohen, 2003, Travica, 2005). The presence of aggregation within a virtual organization is traditionally characterized by the existence of inter organizational systems (IOS), which are in effect, ICT-enabled relationships that geographically co-locate individuals and organizations across time and space (Axelsson, 2003). Such co-localization is vital in assisting members of virtual organization forms to replicate the relationships and connections that would normally be found in face-to-face environments. This in turn promotes their overall success (Griffith et al, 2003).

### **Anchoring**

Anchoring deals with the extent to which cybernization is supported by other key elements of the organization (such as structure or management style). According to Travica (2005), anchoring is crucial to virtual organizations as it provides the

necessary foundation upon which ICT and an organization's potential for virtualizing is based. Stough et al (2000) support this view, suggesting that one of the key strategic recommendations for improving virtual working is ensuring the internal management structure supports and sustains the virtual concept. Indeed, it is often argued that lack of anchoring can in turn cause further problems including an out-of-sight, out-of-mind culture (due to resistance to the unstructured nature of virtual working), and miscommunication (as workers do not have sufficient experience of communicating with rich media forms such as video conferencing).

### **Cybernization**

Cybernization is a key factor associated with organizational virtualness. Its primary focus is the extent to which virtual organizational forms exist in time and space created by electronic information flows and ICT (Travica, 2005). This transcending of legal and organizational boundaries contributes towards assuring that virtual organizations capitalize on the widest variety of existing experts, skills and knowledge, in turn contributing toward their success in a hyper-competitive market (Stough et al, 2000, Barnes and Hunt, 2001, Gibson and Cohen, 2003).

### **Trust**

Trust is a key feature of both traditional and new organizational forms, and is important in the adoption of new technologies. Many researchers who argue that trust often acts as the glue that allows virtual organizations to succeed, are also supportive of the inclusion of trust as a key characteristic of virtual organizational forms (Gallivan and Depledge, 2003). Essentially, trust provides the base upon which organizations and team members can form lasting and strong relationships. Inrona (2001) explains the pivotal role of trust in ICT-dependent relationships by using the metaphor of a house of cards, whereby the failure to trust in one organization or team member can causes the entire virtual organizational entity to collapse.

## **RESEARCH MODEL AND HYPOTHESES**

Figure 1 illustrates Travica's (2005) original model alongside the extended model employed in this study. This section presents the theoretical basis for the extended model, along with the associated hypotheses between the model's constructs (the relationships between constructs in Travica's original model were non-directional).

### **Interoperability**

Our extended model hypothesizes that the presence of social interoperability within an organization will lead to a greater ability to produce a-typical products and services. The primary reason for this is, as argued by Brennan and Braswell (2005), the greater the presence of both shared and specific job roles within an organization or team, the more likely it will be that specific portions of the end goal will be completed. Furthermore, we posit that the ability to create a synchronized environment (as characterized by technical interoperability) directly affects the ability of virtual organizations to create and maintain ICT dependant networks across time and space, which in turn, allows members of virtual organizational forms to interact as if they were co-located (Axelsson, 2003). Therefore we hypothesize:

H1: *Special Product is positively influenced by social interoperability.*

H2: *Aggregation is positively influenced by technical interoperability.*

### **Switching**

Switching allows virtual alliance members to develop their skills and resource base with ease. This results in a range of tasks and functions being achieved simultaneously without the need for increased costs (Mowshowitz, 1997, Chinowsky and Rojas, 2003). In turn, this leads to a greater ability to create a-typical goods and services, which in themselves help to sustain competitive advantage (Dushnitsky, 2004). Therefore we hypothesize:

H3: *Special Product is positively influenced by switching.*

### **Aggregation**

Aggregation plays a significant role within the ISSAAC. Its impact is mostly felt via the constructs switching, social interoperability and special product. In all these cases, aggregation provides the means by which multiple organizations or team members can operate across time and space to either share skills or resources, develop strategic goals, standards, priorities and schedules, or operate as a unit to produce a-typical goods or services (Travica, 2005). We in turn contend that

the greater the presence of aggregation within a virtual organization, the more likely it is that the constructs of switching, social interoperability and special product will be realized. Therefore we hypothesize:

H4: *Switching is positively influenced by aggregation.*

H5: *Social Interoperability is positively influenced by aggregation.*

H6: *Special Product is positively influenced by aggregation.*

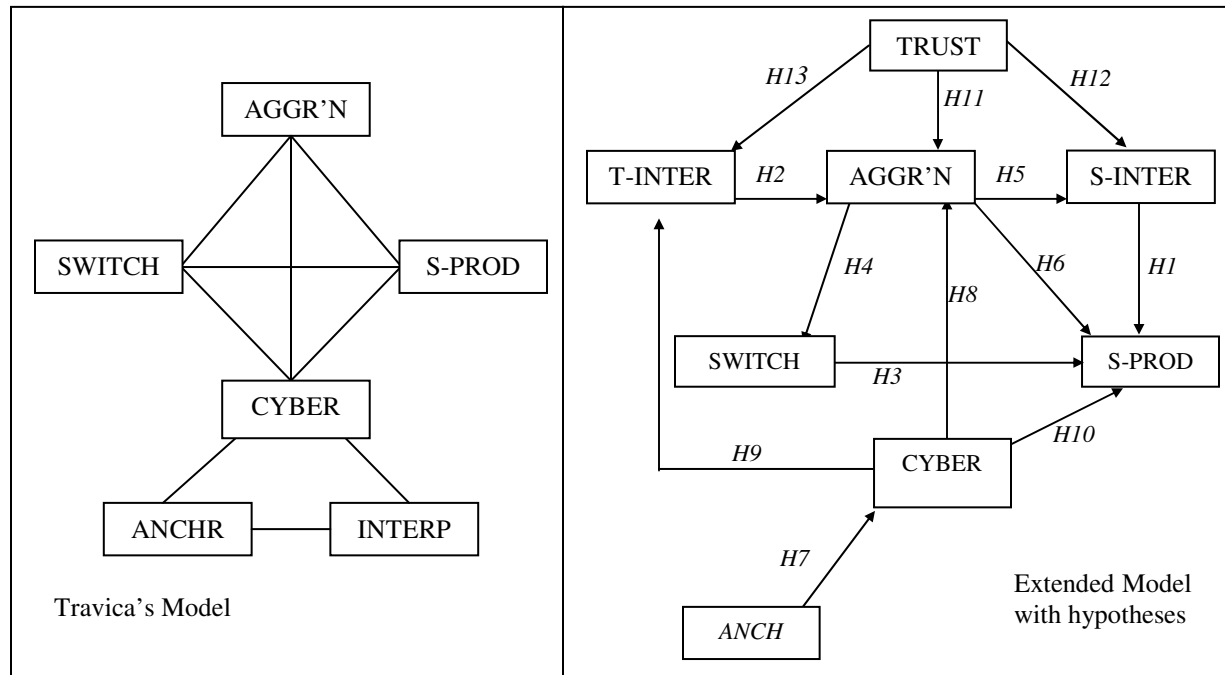


Figure 1. Travica's (2005) ISSAAC model and extended model with hypotheses

### Anchoring

The role of anchoring in the success of virtual organizational forms is vital. According to Mukhopadhyay et al (1995) and Santhanam and Hartono (2003), creating an established support system for cybernization actively contributes toward the successful introduction of ICT into organizations and teams. Stough et al (2000) support this view in arguing that if cybernization does not receive adequate support, the likelihood is that the concept of virtuality itself will fail. Hence:

H7: *Cybernization is positively influenced by anchoring.*

### Cybernization

Cybernization is viewed by Travica (2005) as being a hub variable in the ISSAAC model, and it also plays a significant influencing role in our extended model. Essentially, cybernization acts as the enabling feature that allows aggregation, technical interoperability and special product to emerge. In the case of aggregation, it does this by providing the necessary tools with which to create ICT-enabled networks. In the context of technical interoperability, cybernization allows for the sharing of goals, the creation of synchronized environments and the development of shared ICT standards (Barnes and Hunt, 2001; Travica, 2005). In enabling aggregation and technical interoperability, the presence of cybernization should also result in increased ability to deliver non-standard products (Travica, 2005). Hence:

H8: *Aggregation is positively influenced by cybernization.*

H9: *Technical Interoperability is positively influenced by cybernization.*

H10: *Special Product is positively influenced by cybernization.*

## Trust

Trust is a prominent trait that is fundamental to a variety of virtual forms. Its addition to Travica's (2005) ISSAAC model in this study is justified by both the wider literature, and also by the fact that many researchers in the domain of virtual organizations argue that it is trust that acts as the glue that holds virtual entities together (Jarvenpaa and Leidner, 1999; Gallivan and Depledge, 2003). Consequently, trust, like cybernization and aggregation, impacts upon a number of the key constructs of the research model, most notably, social and technical interoperability and aggregation. In terms of aggregation, trust assists in developing the environment within which aggregated networks and relationships are developed and upheld by replicating relationships often seen in face-to-face environments (Barnes and Hunt, 2001; Paul and McDaniel Jr, 2004). Similarly, within the context of social and technical interoperability, trust facilitates the creation of shared ICT norms and strategic goals, and assists in the development of shared agendas by helping members of virtual organization to develop a sense of unity (Paul and McDaniel Jr, 2004). Therefore we hypothesize:

H11: *Aggregation is positively influenced by trust.*

H12: *Social Interoperability is positively influenced by trust.*

H13: *Technical Interoperability is positively influenced by trust.*

## METHOD

In selecting a suitable research method, the work conducted by Orlikowski and Baroudi, 1991 and Chen and Hirschheim (2004) was taken into consideration. Both studies examined articles published in top IS journals and found that the overriding research approach used was that of a *field study*. Field studies are non-experimental studies taking place in naturally occurring settings. As a result, this means that the researcher is able to obtain more pragmatic results that reflect the "real world" as opposed to the world as perceived by the researcher (Gefen et al, 2000). The selection of a field study as the research method resulted in questionnaires being selected as the primary means of collecting quantitative data - as suggested by Gefen et al (2000).

## Instrument and Participants

Although Straub et al (1989) suggest that researchers should where possible use pre-established instruments and scales in their studies, this was not possible in this case as the ISSAAC model had not been quantitatively tested (indeed assessing the reliability of the indicators was one objective of the study). Therefore, study items were adapted from both Travica's (2005) qualitative study and the extant literature. The scale used to assess the constructs was a five point Likert scale ranging from (1) strongly disagree to (5) strongly agree. In total, the survey instrument comprised 51 questions, of which, 50 were associated with the constructs of the research model and derived from the literature and the remaining item was a demographic item relating to gender. Space limitations preclude discussion of the various questions, although further details are available from the authors. Participants in the study were members of staff of a leading international airline who had regular interaction with the virtual components of the organization. The airline in question was considered appropriate as it displayed key characteristics of operating along a continuum of virtuality. That is, while the foundations of the airline were similar to those typically associated with a bricks and mortar entity, virtual characteristics such as strategic alliances, hot-desking, online sales and self-service check-ins were also present. Following negotiation of question phrasing with airline management, and a period of piloting and pre-testing with 15 staff members, a total of 202 questionnaires were subsequently completed by staff in the presence of a researcher who was able to provide explanation or clarification if necessary. Participation was voluntary and subjects were informed that the study dealt with examining organizational virtualness. The precise nature of study and the underlying research model were not discussed as to not introduce bias. Once data was collected, exploratory factor analysis (using SPSS) was used to determine the distribution of items and the reliability of the scales. Structural equation modeling (using LISREL) was employed to examine the structure of the model via the testing of the associated hypotheses.

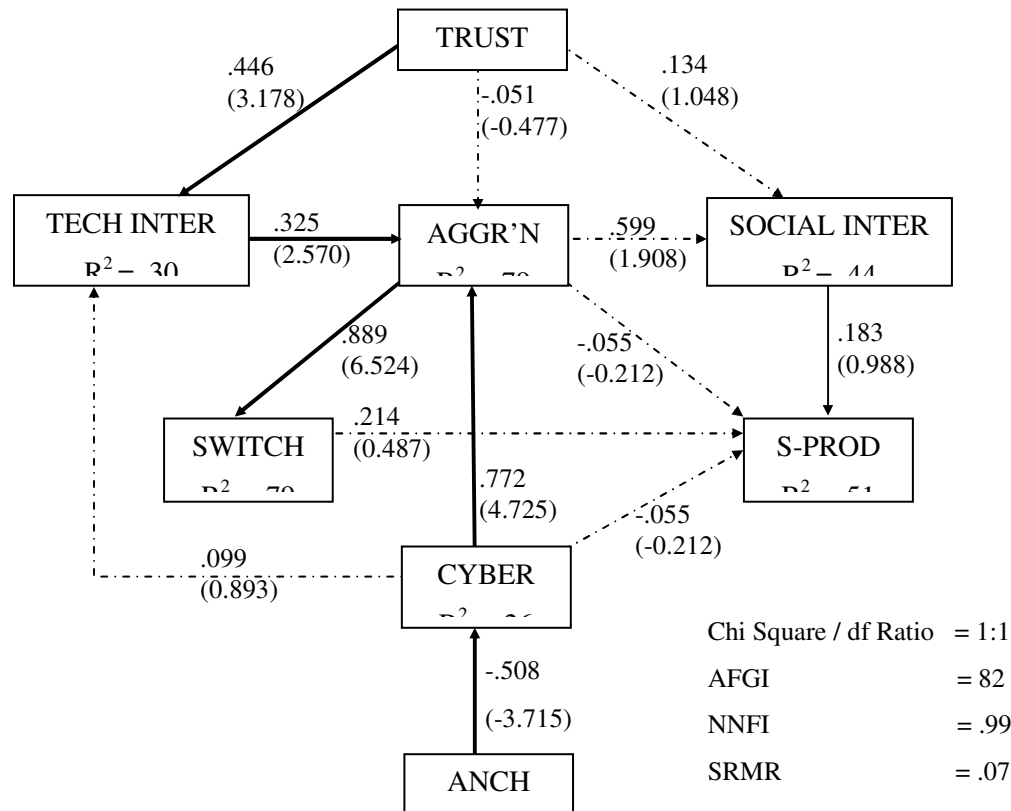
## RESULTS

Of the 202 questionnaires administered, all were answered in full, with no missing values. All participants had active dealings with the organization's ICT on a daily basis. The distribution of gender was reasonably balanced with 41% of respondents being male and 59% female.

The first stage of data analysis was to assess the distribution of the indicators across the underlying factors of the data set, and involved the use of SPSS to perform factor analysis with a PROMAX rotation. Following a number of rotations (and removal of unfavorable items), a satisfactory distribution of indicators was achieved with all items grouping and loading significantly onto one factor only. This allowed for assessment of the measurement model in terms of both construct reliability and

construct validity. Construct reliability was measured using two criteria: item reliability and Cronbach's alpha. Item reliability measures the amount of variance in an item, and is significant at values greater than or equal to .50 (Chau and Lai, 2003). In this study, alpha values were deemed significant at values greater than or equal to .65 and outstanding at values greater than or equal to .70 (Cortina, 1993, Gefen et al, 2000). Approximately 50% of the item reliabilities met the required threshold for acceptability, while all of the factor scales were statistically reliable against an alpha value of .65. The second appraisal of the measurement model took the form of assessing the construct validity of the model's indicators via the average variance extracted statistic (AVE). AVE measures the amount of variance captured by the underlying factor in relation to the amount of variance due to measurement error, and in order to be significant, a factor's AVE must be greater than or equal to .50. (Chau and Lai, 2003, Gefen et al, 2000). In this study, six of the eight constructs had significant AVE values (cybernization, trust, anchoring, special product, technical interoperability and switching). Furthermore, for all but three of the constructs (aggregation, social interoperability and switching) AVE values were greater than any other inter-correlatory relationships.

The second stage of data analysis assessed the fit of the model to the data captured, examined the exploratory power of the constructs, and tested the significance of the hypothesized paths of the model. Overall goodness of fit of the model was tested using the following common fit measures: chi-square/degrees of freedom ratio, AGFI, NNFI, SRMR and RMSEA (which have acceptable thresholds of less than 3:1, above .80, above .90, less than .05 and less than .05 respectively). As illustrated in Figure 2, the research model exhibited a satisfactory to good fit.



**Figure 2. Structural Model and Fit Indices (standardized path coefficients indicated, t-values in parentheses, bold lines = supported paths, dotted lines = unsupported paths)**

The explanatory power of the model was examined in terms of portion of variance explained (where R<sup>2</sup> values greater than .50 indicated acceptable influence). The results (see Figure 2), suggest that while the explanatory power of the model was significant for three of the endogenous constructs (special product, aggregation, its descriptive strength for the remaining three constructs was poor (cybernization, technical and social interoperability all had R<sup>2</sup> values of less than .50). Finally, the significance of the relationships specified by the research model was evaluated against a t-value of 1.96 (as recommended by Diamantopoulos and Siguaw, 2000). The data presented in both Table 1 (where shaded cells represent non-significant paths) and in Figure 2 (where dotted lines represent non-significant paths) indicates that of the 13 stated hypotheses, only five were supported by the data gathered in this study: H2, H4, H7, H8 and H13.

| Hyp | t-value | Interpretation of Result  |
|-----|---------|---|
| H1  | 0.988   | Ability to produce a-typical goods/services not influenced by level of shared strategic goals.  |
| H2  | 2.570   | The greater the shared ICT standards, the greater their ability to create ICT-enabled networks.                                       |
| H3  | 0.487   | Ability to develop unique and interchangeable skills does not affect ability to produce a-typical products/services.                  |
| H4  | 6.524   | Ability to share skills becomes greater with increased presence of IOS that connect virtual organization members.                     |
| H5  | 1.908   | Creation of strategic goals is not influenced by degree to which members of virtual organizations are connected via electronic means. |
| H6  | -0.212  | Production of a-typical goods/services is not influenced by the presence of IOS.  |
| H7  | -3.715  | Lack of support for cybernization will lead to the failure of virtuality.   |
| H8  | 4.725   | Presence of ICT influences ability of virtual organizations to create ICT-enabled networks that co-locate members of dispersed teams. |
| H9  | 0.893   | Presence of shared ICT standards is not influenced by the degree to which an organization exists in an electronic time and space.     |
| H10 | -0.212  | Degree to which an organization exists in electronic time and space does not affect production of a-typical goods/services.           |
| H11 | -0.477  | Creation of ICT enabled networks is not influenced by the ability of virtual organization members to trust one another.               |
| H12 | 1.048   | Creation of shared strategic goals is not influenced by degree of trust between organizations.  |
| H13 | 3.178   | Increased presence of trust will lead to increased development of shared ICT standards.   |

**Table 1. Significant /non-significant hypothesized paths**

## DISCUSSION

This study has examined the concept of organizational virtualness, and by taking Travica's (2005) ISSAAC model as a base and adding the construct trust, an extended model for the investigation of virtual organizations has been developed. As a result of testing the model using data from 202 staff members of a leading international airline, five of the 13 initial hypotheses were supported.

Results reveal that there is a positive causal link between the construct of aggregation and that of technical interoperability. This reflects suggestions made in the literature and confirms that the greater the degree of shared ICT standards between members of virtual organizations, the more likely the ability to create ICT enabled networks becomes. Therefore, before organizations embark on becoming members of virtual organizations, they should ensure they and their prospective partners are using compatible software, hardware and general ICT standards. If they do not do this, their potential for connecting partners across time and space via ICT will be significantly reduced.

Statistical evidence also supported an underlying link between the constructs of aggregation and switching. This is of particular importance to organizations operating along the continuum of virtuality because often members of virtual entities are de-located; consequently, this means that they are not able to share knowledge and resources as easily as traditional organizations. However, through the creation of ICT enabled networks that transcend distance and co-locate partners. The exchange of skills and knowledge in virtual organizations can be achieved with the same ease as it is in co-located organizations.

The conformation of a cause and effect relationship between the constructs of anchoring and cybernization suggests that if organizations are aiming to exist in a time and space enabled by electronic information flows and ICT. It is also vital that they create a structured system of maintenance and support for this movement. If this does not occur, it can be statistically argued that an organizations ability to succeed through virtuality will not be realized.

Results showed that there is a positive correlation between cybernization and aggregation. A reason for this may be that essentially cybernization (as suggested by the literature) acts as an enabling factor that allows aggregation to occur. In that it provides the environment within which ICT enabled networks can be created and maintained. Therefore, organizations wishing to transcend normal legal and organizational boundaries must first ensure that they learn to operate in an unconventional environment enabled by ICT. This in turn will lead to the successful development of IOS and ICT enabled networks.

The implication of a significant causal link between technical interoperability and trust is of particular importance, as it solidifies the addition of the construct trust to Travica's (2005) original model. Furthermore, it also demonstrates that before



virtual organizations can create shared ICT standards and software they must first develop a sense of trust in one another. If this does not occur then like ICT standards cannot be developed and the environment within which to share knowledge, skills and resources is unattainable.

## CONCLUSION

As the number of ICT-dependant and increasingly virtual organizations grows, there exists a parallel need to adequately identify the factors that define virtual organizations. Of particular importance is the empirical examination of the interactions between these factors. By drawing upon existing literature, this study has extended an existing but untested model of organizational virtualness, and by using data collected from more than 200 participants, has empirically investigated both the characteristics of virtual organizations and the relationships between these constructs. Results of the data analysis generally support the model and show statistical evidence in favor of five of the 13 proposed hypotheses. In particular, the research showed that: both trust and cybernization have a positive influence on technical interoperability, which in turn positively influences the capacity of a virtual organization to create ICT-enabled networks; such networks consequently determine the level of switching that takes place - all of which is not possible if the ICT-enabled features of the organization are not adequately anchored. Therefore, it can be argued that the exclusion of aggregation, interoperability, switching, trust, cybernization or anchoring will lead to a virtual organization's reduced ability to achieve their potential through ICT.

As with any investigation, there is always an issue of generalizability and this study is no exception. In order to strengthen the foundation of the research model, further work is required in order to determine the extent to which our findings can be applied to include other persons, settings, and times, particularly as our investigation finds support for a limited number of the stated hypotheses (and hence further exploration is clearly necessary). One way of achieving this would be to test the ISSAAC model and its associated hypotheses in organizations operating along the continuum of organizational virtualness in industries different to the one used in this study. This will not only assist in establishing the validity of the model, but will also help to strengthen the propositions made. Further work is also required on understanding the relationships between constructs, and the relationships between constructs and indicators. A means of achieving these aims may be via the examination of modification indices (and consequently model cross-validation). Developments in these areas will assist in the development of a robust model suitable for understanding varying types of organizational virtualness and increasing the overall awareness of virtuality in modern day organizations.

## REFERENCES

1. Axelsson, K. (2003). Analysing Business Interaction in a Virtual Organization – Using Business Action Theory to study Complex Inter-Organizational Contexts, *Journal of Electronic Commerce in Organizations*, 1(3), 1-27.
2. Barnes, S. and Hunt, B. (2001). Recognizing the potential of e-business, In *E-Commerce & V. Business* (Barnes, S and Hunt, B. Eds), p 1-4. Butterworth Heinemann, Oxford, UK.
3. Bauer, R. and Koszegi, S.T. (2003). Measuring the Degree of Virtualization. *Electronic Journal of Organizational Virtualness*, 5(2), 26-45. <http://www.virtual-organization.net/> Site Visited 17/11/04.
4. Chinowsky, P.S. and Rojas, E.M. (2003). Virtual Teams: Guide to Successful Implementation. *Journal of Management in Engineering*, 19(3), 98-106.
5. Chau, P.Y.K and Lai, V.S.K. (2003). An Empirical Investigation of the Determinants of User Acceptance of Internet Banking. *Journal of Organizational Computing and Electronic Commerce*, 13(2), 123-145.
6. Cortina, J.M. (1993). What is Coefficient Alpha? An Examination of Theory and Applications. *Journal of Applied Psychology*, 78(1), 98-104.
7. Diamantopoulos, A. and Siguaw, J.A. (2000). *Introducing LISREL. A Guide for the Uninitiated*. SAGE Publications, Thousand Oaks. CA, USA.
8. Dushnitsky, G. (2004). Limitations to inter-organizational knowledge acquisition: The paradox of Corporate Venture Capital. *Academy of Management Proceedings*. 1-6.
9. Gallivan, M.J. and Depledge, G. (2003). Trust, control and the role of interorganizational systems in electronic partnerships. *Information Systems Journal*, 13(2), 159-190.
10. Gefen, D., Straub, D.W. and Boudreau, M.C. (2000). Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of AIS*. 4(7), 1-79.

11. Gibson, C.B. and Cohen, S.G. (2003). *Virtual Teams that Work: Creating Conditions For Virtual Team Effectiveness*. Jossey Bass Wiley. UK.
12. Gottfredson, M., Puryear, R. and Phillips, S. (2005). Strategic Sourcing From Periphery to the Core. *Harvard Business Review*, 83(2), 132-140.
13. Griffith, T.L., Sawyer, J.E. and Neale, M.A. (2003). Virtualness and Knowledge in Teams: Managing the Love Triangle of Organizations, Individuals and Information Technology. *MIS Quarterly*, 27(2), 265-287.
14. Hale, R. and Whitman, P (1997) *Towards the Virtual Organization* McGraw Hill. Berkshire, UK.
15. Introna, L. (2001). Defining the Virtual Organization, In: *E-Commerce & V. Business* (Barnes, S and Hunt, B. Eds), p 143-152. Butterworth Heinemann, Oxford, UK.
16. Jarvenpaa, S.L. and Leidner, D.E. (1999). Communication and Trust in Global Virtual Teams. *Organization Science*, 10(6), 791-815.
17. Mowshowitz, A. (1997). Virtual Organization, *Communications of the ACM*, 40(9), 30-67.
18. Nayak, N., Bhaskaran, K., and Das, R. (2001). Virtual Enterprises: Building Blocks for Dynamic E-Business. *Australian Computer Science Communication*, 23 (6), 80-87.
19. Mukhopadhyay, T., Kekre, S. and Kalathur, S. (1995). Business value of information technology: A study of electronic data interchange. *MIS Quarterly*, 19(2), 137-157.
20. Paul, D.L. and Mc Daniel, Jr, R.R. (2004). A Field Study of the Effect of Interpersonal Trust on Virtual Collaborative Relationship Performance. *MIS Quarterly*, 28(2), 183-227.
21. Piris, L., Fitzgerald, G. and Serrano, A. (2004). Strategic motivators and expected benefits from e-commerce in traditional organizations. *International Journal of Information Management*, 24(6), 489-506.
22. Saabeel W, Verduijn T.M, Hagdorn L., and Kumar K.(2002). Model of Virtual Organization: A Structure and Process Perspective. *Electronic Journal of Organizational Virtualness*, 4 (1), 1-16. <http://www.virtual-organization.net/> Site Visited 09/03/04.
23. Santhanam, R. and Hartono, E. (2003). Issues in Linking Information Technology Capability to Firm Performance. *MIS Quarterly*, 27(1), 125-165.
24. Stough, S., Eom, S. and Buckenmyer, J. (2000). Virtual Teaming: a strategy for moving your organization into the new millennium. *Industrial Management and Data Systems*, 100 (8), 370-378.
25. Travica, B. (2005). Virtual Organization and Electronic Commerce. *The DATABASE for Advances in Information Systems*, 36(3), 45-68.