Designing a framework for acquiring technological knowledge among technology transfer recipients—A perspective from a radar manufacturing firm in Malaysia

Thanaletchumi Sathasivam[1, 2], Zuraini Ismail[1], Ahmad Rahman Songip[1]

(1. Business Advance Technology Center, University Technology Malaysia, Skudai 81300, Malaysia;

2. IRIS Corporation Berhad, Bukit Jalil 57000, Malaysia)

Abstract: Technology transfer is becoming increasingly important for business and economic growth in developing nations. The modern global economy uses knowledge resources to increase productivity and foster improvements in standard of living. Individual businesses acquire knowledge of advanced technologies to establish and maintain competitive positioning in the global marketplace. Without proper knowledge acquisition, transfer of technology cannot take place. The process of acquiring knowledge requires the organization to choose or adapt elements of the technology to local cultural conditions to integrate it with indigenous technologies. The cultural context of the recipient can also affect the process of acquiring knowledge. The culture and social environment of the individual creates a schema for organizing knowledge and understanding reality. This paper has two objectives: Firstly, to investigate how organisational culture affects readiness for technology transfer, and secondly, to identify elements of organisational culture affecting readiness for technology transfer. Qualitative mode of data collection was used in this study as well as interview and focus group discussion. The results from the preliminary investigations were used to create the components of the framework. Hypotheses were formulated between the constructs of the framework and a rigorous attempt was made using Structural Equation Modelling (SEM) to validate the construct as they created through qualitative findings.

Key words: readiness; organizational culture; technological knowledge; absorption capacity; transfer of technology

1. Introduction

Technology transfer is crucial to developing nations and businesses. Significant variability exists in the way organizations approach the process, and the success rate, with no recognized or established standard for approaching the technology transfer process (Cohen, 2004). Researchers have identified many potential causes for failure, such as insufficient technical support from the transferring entity, insufficient basic knowledge among an organization's employees to use the technology and inadequate management of change in the organization (Cohen,

Thanaletchumi Sathasivam, Engineering Doctorate candidate, Business Advance Technology Center, University Technology Malaysia, IRIS Corporation Berhad; research field: technology management, technology transfer and knowledge management.

Zuraini Ismail, Ph.D. in management information systems, associate professor, Business Advance Technology Center, University Technology Malaysia; research fields: IS and IT outsourcing.

Ahmad Rahman Songip, Ph.D. in chemical engineering, associate professor, Business Advance Technology Center, University Technology Malaysia; research fields: personal and financial management, entrepreneurship development, scenario planning, blue ocean strategy, creative problem solving and creativity and innovation strategy.

2004). Previous research has identified organizational culture as an important factor influencing the outcome of technology transfer, with the organizational culture affecting readiness (Cui, et al., 2006). The processes necessary to capture the explicit and tacit knowledge necessary to adopt a transferred technology often require significant change in employee behaviour.

Effective technology transfer requires the organizational culture to foster knowledge sharing behaviour to facilitate the spread of tacit knowledge. Organizational factors such as highly compartmentalized departments, lack of a team approach, and internal competition could prevent the organization from developing the cooperation necessary for adopting the new technology. In addition, the new technology may represent a change that the employees perceive as threatening, which induces resistance to adopting the technology. In this context, reference was made to recent research investigating the technology transfer process in developing countries. It concluded that organizational culture influences the interaction between the source and the recipients of a new technology (Kasimin, Ibrahim & bin Yusoff, 2009). It also emphasized that in any processes based on human initiatives, importance has to be placed on organizational culture. Adopting and effectively implementing technology may require changes to the organizational culture to foster greater acceptance and readiness to use the technology among employees.

Based on these considerations, the aim of the study was to address the following two research questions:

(1) How does organizational culture affect readiness for technology transfer?

(2) Which elements of organizational culture affect readiness for technology transfer?

This paper is organised into 6 sections. This section introduces the study and provides the research questions. Section 2 portrays the literature and the subsequent section describes the research methodology. Section 4 describes the results and findings. Reliability and validity measures are discussed in section 5. The paper concludes with a discussion on the way forward beyond this study.

2. Literature review

This section firstly defines organizational culture followed by various previous researches that provide perspectives to the research questions.

2.1 Organizational culture and technology transfer

In the specific context of technology transfer, Simonin (2004) defined organisational culture as “the degree to which employees are encouraged to rethink the logic of current behaviors, to question established routines and beliefs and to challenge established wisdom”. Hofstede (1991) suggested that organisational culture is “the collective programming of the mind which distinguishes the members of one organization from another”. Based on these general definitions, the organisational culture establishes the standards for the behaviours expected of employees, with individuals exhibiting variant behaviours marginalised or terminated by the organisation. National cultural factors do influence organisational culture, and are particularly relevant in the context of international technology transfer. Cross-cultural differences in values, beliefs and norms produce significant differences in management practices and the perceptions of employees of the organisational culture.

Investigations into technology transfer indicate that organizational culture can influence the transfer process in areas such knowledge acquisition, sharing and transfer (Ishida, 2004). Organizational culture is also related to readiness through its influence on the expectations of managers and employees about the benefits and ability to use the new technology (Sundbo & Fuglsang, 2002). Therefore, organizational culture could have both a direct effect on the technology transfer process and an indirect effect for readiness and acquiring knowledge necessary for the transfer.

Many factors influence organizational culture, which creates difficulties for identifying the components of organizational culture critical for technology transfer. The rewards system, methods for selecting and advancing employees, and the operational decisions by managers shape culture of an organization (Chandler, Keller & Lyon, 2000). The structure of the organization also has an influence on culture, with vertical and compartmentalized structures fostering a mechanistic culture while horizontal and matrix structures foster an entrepreneurial culture (Miller, Bierly & Daly, 2007). Organizations can also have a formal culture created by its policies and procedures and an informal culture developing from the practices of its employees (Foss, 2005).

The model of organizational culture developed by Sonnentag (2002) indicates that the culture is bifurcated into the perceptions of managers and the perceptions of employees. The perceptions of managers are based on the formal elements of the organizational culture, such as structure, policies and degree of management control. The perceptions of employees reflect the informal culture of the organization such as the networking relationships, the degree of commitment to the formal norms and values and the degree of independent decision-making perceived as acceptable. The greater the alignment between the organizational culture and the processes associated with technology transfer, the more likely the transfer will be effective (Simon & Lane, 2004).

2.2 Readiness in technology transfer

A necessary precondition to support the transfer of technology is the readiness of recipients to accept the technology and the capacity to acquire the knowledge and skills necessary to use the technology (Ouma-Onyango, 1997). This definition indicates that readiness can be decomposed into the two dimensions of willingness and capacity, with both dimensions necessary for effective technology transfer. Willingness is related to the state of mind of the organization and its leadership about the need and desirability of adopting the technology. Sufficient willingness is necessary among the employees of the firm to motivate the effort necessary to adopt the technology and to overcome socio-cultural impediments such as resistance to change. Capacity is related to the abilities of the employees of the organization to understand the technology, the fundamental principles underlying the technology, and the way the technology can be used within current organizational operation.

Agmon and von Glinow (1991, p. 93) noted that many of the "problems of technology transfer are encountered because the receiving organization is not able or ready or willing to absorb the technology either because of lack of knowledge or wrong incentives". Having established this information and facts, we would be in a position to establish answers to the research questions.

2.3 Managing knowledge in technology transfer

Knowledge in an organization is the combination of all information about policies, practices, data, and experience and exposure of personnel that can be harnessed to achieve the objectives of the organization (Bhatt, 2002). Gopalakrishnan and Santoro (2004) distinguish between knowledge transfer and technology transfer, suggesting that the variables involve different processes, although knowledge transfer may be essential for technology transfer. Kallil, Claudio and Seleim (2006) also claimed that managing knowledge and the transfer are the central elements in the technology transfer process. The way in which the organization has developed its knowledge management system can influence the degree of absorption of the knowledge necessary for technology transfer.

The knowledge management system used by the organization is a critical construct in affecting absorptive capacity because it controls the formal and informal routines related to the acquisition and dissemination of knowledge (Bounfour, 2003; Kallil, Claudio & Seleim, 2006). It involves the system used for networking among employees and the transfer of information and knowledge (Daghfous, 2004). The level or type of technology in use in the organization also affects capacity. Organizations using technologies similar to the transferred technology will have greater capacity to absorb the new technology (Kumar & Marg, 2003). As a result, the capacity dimension of readiness includes education, training, experience, the knowledge management system, and the existing use of technology in the organization. The knowledge management system is composed of both formal and informal components that can theoretically influence the technology transfer process.

The knowledge management system utilized in the organization can influence the capacity of the organization to acquire and use the information necessary to support the new technology (Oztemel & Polat, 2007). Therefore, a relationship also exists between the knowledge management system of the organization and readiness for technology transfer. The knowledge management system is a significant factor in the ability of the organization to disseminate both explicit and implicit knowledge to the individuals requiring information. The capacity of the organization in terms of its existing level of knowledge and experience in turn influences the way it uses the knowledge management system during the technology transfer process. A high capacity in terms of knowledge and experience is related to increased reliance on the organization's knowledge management system.

3. Methodology

In addressing the research question, interviews and focus group discussions were carried out to determine the components for the framework. These participants were purposefully selected to provide insights into the introduction of new technology that was intended to advance the existing technologies within the firm.

3.1 Qualitative data collection instruments

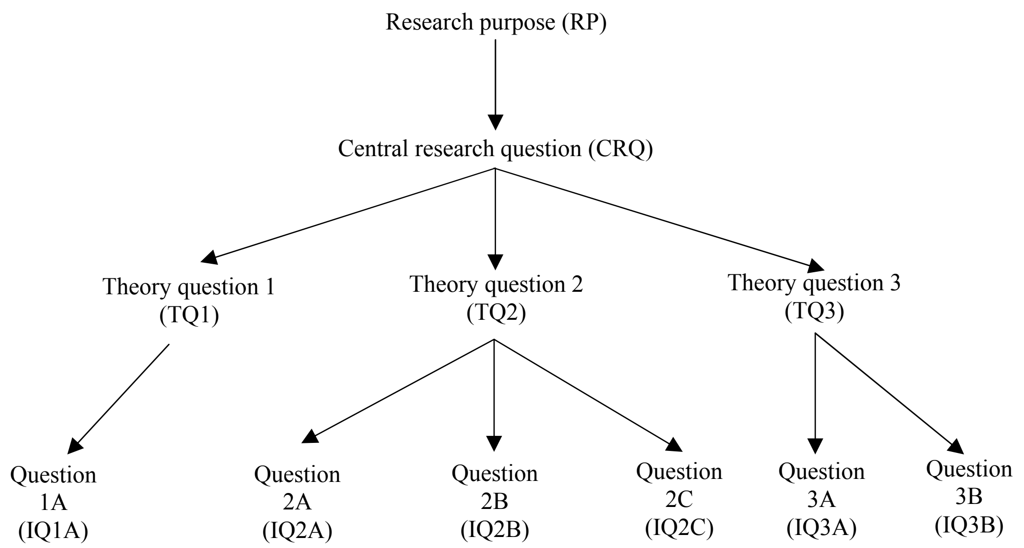

Fig. 1 Process for developing the questions

Data source: adopted from Wengraf (2001, p. 157).

The data collection instruments in the qualitative phase of the study consisted of open ended questions posed to the interviewees and focus group participants. The questions were intended to obtain information about the perceptions and experiences of the study participants about the technology transfer process. The questions were derived from the issues identified by previous researchers investigating technology transfer. In semi-structured interviews and focus group sessions, the interviewer or moderator asked additional follow-up question based on the responses of participants to the initial question. During the focus group sessions, the moderator posed an initial question and asked follow-up questions based on the points of discussion raised by the participants in the group. The development of the questions followed the recommendations of Wengraf (2001) in which the questions should be based on theory but should use the language commonly used by the interviewees. Each interview question should nonetheless have a logical relationship to the theory. Fig. 1 shows the process for developing the questions.

The general structure conformed to this pattern of relating the questions to the theoretical issues underlying the research. Question 1 was a general question connected to the overall research purpose and intended to establish the general direction of the participants. Question 2, Question 3 and Question 4 were related to the readiness construct. Question 5, Question 6, Question 7 and Question 8 were related to organisational culture. Question 9, Question 10 and Question 11 were related to knowledge management. Question 12 and Question 13 were related to the effectiveness of the technology transfer process.

3.2 Focus groups

Three focus group sessions were held with eight participants in each focus group in October and December 2009. These participants came from across the organization. However, detailed information was not collected regarding focus group participants, in order to reduce the potential for researcher bias. Specifically, there was the potential issue that the researcher may be more inclined to take into account feedback of focus group participants if their positions were known. The focus groups included 24 participants. The group included 10 Bachelor holders, nine Diploma holders, three Masters holders, one Certificate holder and two holders of other degrees. Average number of years in the project was 6.4 years.

3.3 Interviews

The interview process followed the recommendations of Taylor and Bogdan (1998) concerning the interactions between the interviewer and the interviewees. A total of eleven interviews were conducted with members of the management staff in September 2009. These interviews were conducted across nine different departments in the organization. Individual interview participant educational levels included seven Bachelor holders, three Master holders and one Doctorate holder. The average number of years on the project was 5 to 6 years. All participants except one were between 30-39 years, with one being between 20 and 29 years.

4. Results and findings

Based on the approach taken in the previous section, the findings were analyzed using iterative thematic analysis (content analysis), with three levels of coding used (open coding, axial coding and narrative coding). The example of the analysis and the findings are shown in this section.

4.1 Results from focus groups

The responses of the focus groups who indicated each of the problems that were identified during the coding process for analysis purposes is shown in Table 1.

4.2 Results from interviews

The open coding process was primarily conducted on the interviews, in which direct responses were recorded. This was then supported by the outcomes of the focus group participants during the axial coding process. A sample of the coding process has been included for demonstration of the practice as shown in Table 2.

Table 1 Problems encountered during the technology transfer process (one of the questions)

Problem	FG1	FG2	FG3
On-time completion of tasks		X	
A lot of guidance needed		X	X
Corrections needed		X	
Not able to identify risks and issues		X	
A lot of time wasted on corrections, quality issues		X	X
Cost of corrections		X	X
Training and knowledge of staff did not match needs of project	X		
Timeline was too short	X		X
Difficulty understanding			X
Staff was not prepared	X		X
Overtime required			X
Lack of staff buy-in for the project (some doing it for the overtime)			X

Table 2 Example of open coding (interview responses)

There are different categories of staff here. Some are willing all the way just to accomplish the mission 1. Some are only will if the management is planning to provide extra benefits and increase their remuneration package 2. Some are not interested in the extra hours as they have their own commitment 3. So, we have a mixed group when we talk about willingness in this company. (1) Organisational commitment/internal motivation; (2) Transactional leadership/external motivation; (3) Work-life balance.
Fine. Both parties were dealing in a professional manner 1. However it was hoped 2 that there should have been more support from the source 2. Perhaps they should have had more people here to support our staff 3. (1) Professionalism; (2) Mismatched expectations; (3) Lack of support; (4) Lack of support.
As far the organization is concern, the management is very supportive 1. However they should relax 2 the policies and procedures 3 and should take a different approach 4 to manage this project. (1) Supportive management; (2) Organizational hierarchy; (3) Policy/procedure mismatch; (4) Change needed.
The most tensed 1 experience in my life. I had the portfolio to chase the deliverable 2 and there was no way to assist the units 3. (1) Stress/strain; (2) High expectations; (3) Lack of knowledge.
There are 2 parts to this challenge 1. First is to produce and second is to innovate. I am sure they can produce 2. My concern would be on the quality of the product for innovation 2. Earlier I did mentioned about "Not knowing the unknown" 4. On that note, this product was introduced by the source 5. Therefore the production was based on this. Now in order to be competitive, we will have to find out what is "out there" and work on it 6. It could be a "wild goose chase". Not knowing the beginning and end 7. (1) Awareness of dichotomy; (2) Production: surety; (3) Innovation: Uncertain; (4) Fear of unknown/lack of knowledge; (5) Ongoing source dependence; (6) Lack of knowledge; (7) Lack of knowledge.

The output of the open coding process was used as the input for the axial coding process. During this process, the specific underlying constructs that were identified in the research questions and hypotheses were used as a focus for the coding process. Categories produced were then collapsed and the resulting constructs or concepts were used as the focus for identifying the appropriate questions to be asked during the quantitative process. Table 3 identifies the correspondence of focus group and interview questions to specific constructs that were used within the research questions.

Table 3 Correspondence of focus group and interview questions to research constructs

Construct	Interview questions	Focus group questions
General outcomes/attitudes	1	1
Readiness		
Capability	4	3
Willingness	3	4
Barriers to implementation	2	
Organizational culture	5, 6, 7, 8, 10	5, 6, 7, 8
Knowledge management	9, 10	9, 10
Effectiveness	12, 13	2

4.3 Proposed conceptual model

Based on the qualitative analysis conducted, a conceptual model depicting the factors influencing technology transfer at organizational level is proposed in Fig. 2.

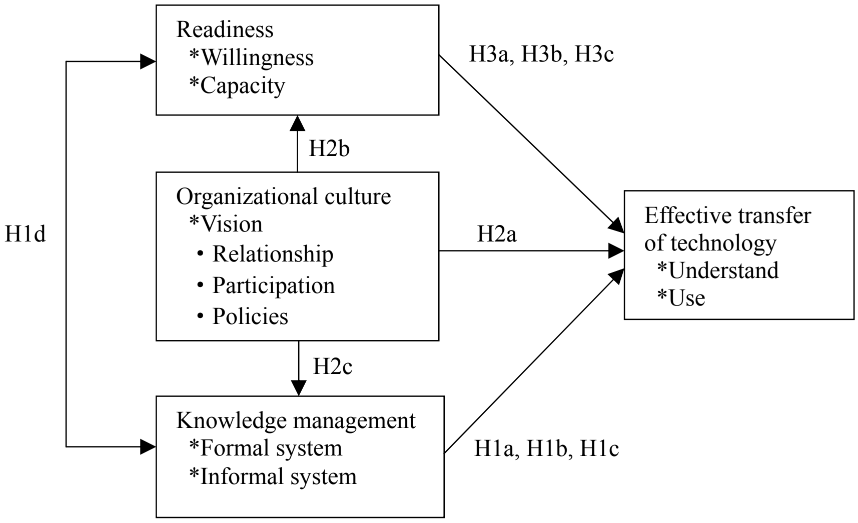

Fig. 2 Proposed conceptual model

The model is based on the theoretical assumption that bivariate relationships exist between the independent variables of readiness, organizational culture and knowledge management, and the dependent variable of effective transfer of technology. In each bivariate relationship, a change in the value of any one independent variable can influence the effectiveness of the transfer of technology. Due to the complexity of the technology transfer process, the model incorporates multivariate influences among the three major independent variables. Organizational culture and the approach of the organization to knowledge management affect readiness for technology transfer. Organizational culture is presumed to influence both the willingness and the capacity for technology transfer, which are the two central elements of the readiness variable. Organizational culture is also assumed to influence the processes associated with knowledge management by establishing the values and norms related to knowledge acquisition and dissemination. Readiness also influences the process of knowledge management by establishing the absorption capacity for the organization. The interrelationship of the independent variables within the model represents a complex set of organizational processes necessary for the effective transfer of technology.

4.4 Hypotheses development

Knowledge management is an independent variable in the research, and is based on the theoretical assumption that knowledge transfer is the central element in the technology transfer process (Kallil, Claudio & Seleim, 2006). These components of the knowledge management system are operationalised in the specific operating environment and support the first hypothesis of the study:

H1a: A positive relationship exists between the utilization of knowledge management system and the effectiveness of technology transfer.

H1b: A positive relationship exists between the utilization of formal knowledge management system and the effectiveness of technology transfer.

H1c: A positive relationship exists between the utilization of informal knowledge management system and the effectiveness of technology transfer.

A relationship also exists between the knowledge management system of the organization and readiness for technology transfer. Due to the interaction between the readiness and knowledge management variables, the relationship can be positive:

H1d: A positive relationship exists between the knowledge management system and readiness for technology transfer (assuming that knowledge management is tested first).

The second independent variable in this research is organizational culture, which is considered as influencing the technology transfer process (Chandler, Keller & Lyon, 2000; Miller, Bierly & Daly, 2007). The variable is operationalised for the purposes of this research and the research includes: (a) the relationships of employees with supervisors and co-workers; (b) the degree of participation in the decision making processes related to technology transfer; and (c) the organizational emphasis on strict adherence to policies and procedures. The independent variable of organizational culture together with the dependent variable of effectiveness of technology transfer supports the second hypothesis of the study:

H2a: A positive relationship exists between the organizational culture and the effectiveness of technology transfer.

The research model suggests that organizational culture has a direct influence on the other independent variables in the study of readiness for technology transfer and knowledge management. It can also influence the internal social networking of the organization that influences the knowledge is disseminated. The hypotheses H2b and H2c examine the relationship of organizational culture with the other related dependent variables:

H2b: A positive relationship exists between organizational culture and readiness for technology transfer.

H2c: A positive relationship exists between organizational culture and knowledge management systems.

The final independent variable in this research is readiness, and is accepted as a significant factor influencing the outcome of technology transfer (Milutinovic & Patricelli, 2002; Ouma-Onyango, 1997). Readiness is relevant to the research model, because it involves the ability of the receiver to understand, absorb and apply the technology to achieve the purpose contemplated at the outset of the transfer process. The independent variable of readiness together with the dependent variable technology transfer effectiveness supports the third hypothesis of the research.

H3a: A positive relationship exists between organizational readiness and the effectiveness of technology transfer.

H3b: A positive relationship exists between willingness to adopt a new technology and the effectiveness of technology transfer.

H3c: A positive relationship exists between the capacity to adopt a new technology and the effectiveness of technology transfer.

5. Reliability and validity measures

This section deals with reliability and validity as the qualitative results were used to determine the components in the conceptual model. For internal consistency, reliability was tested by the Cronbach's alpha. The results are shown in Table 4.

Table 4 Reliability analysis

Independent variable	Construct	Items in scale	Cronbach's alpha
Effectiveness	(1) Use	5	0.760
	(2) Understand	5	0.789
Readiness	(1) Willingness	5	0.501
	(2) Capacity	4	0.645
Organizational culture	(1) Participation	5	0.141
	(2) Policies	4	0.751
Knowledge management	(1) Formal	5	0.689
	(2) Informal	5	0.521

A Cronbach's alpha of 0.59 or below is considered to be poor, while 0.60 to 0.80 is sufficient for exploratory analysis and 0.80 represents a high level of internal reliability. Table 4 shows the results of this test. It shows that the capacity, policies and formal knowledge management constructs were reliable (on the scale of an exploratory analysis), while willingness, participation and informal knowledge management were not as strongly reliable. In the case of participation, it cannot be considered to be reliable at all. The convergent validity test assesses the different measures gathered indicating the same concept (Kerlinger & Lee, 2000). The convergent validity test uses the correlation of items with total-score. All the items with item-to-total correlation scores are higher than the recommended value of 0.50. For the discriminant validity test, factor analysis was used. Factor analysis adopts principal factor analysis varimax rotation, grouping the items representing each construct. Items with factor loading values less than cutoff values were deleted. The details follow in Table 5.

Table 5 Inter-item correlation and factor loading for items in construct effective transfer

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	A1	A2	A3	A4	A5	
A1	3.29	1.678	1.000	0.388	0.554	0.432	0.350	0.711
A2	3.15	1.676	0.388	1.000	0.556	0.430	0.369	0.717
A3	2.72	1.519	0.554	0.556	1.000	0.630	0.548	0.880
A4	3.05	1.622	0.432	0.430	0.630	1.000	0.442	0.780
A5	3.08	1.654	0.350	0.369	0.548	0.442	1.000	0.706

Based on the inter-item correlation coefficients for effective transfer of technology, each of these items does correlate adequately with at least one other item in the construct ($0.3<r<0.9$), although there is no perfect correlation between any item, and the highest correlation is 0.630. These questions were then submitted to exploratory factor analysis (EFA) in order to identify the underlying theoretical structure of the data. The outcomes of this analysis indicate a Kaiser-Meyer-Olkin (KMO) value of 0.825, which is considered to be a very strong result. Table 5 presents the details. A single factor extracted from these results explained 58% of the total variation in the five items examined. Confirmatory factor analysis was conducted as well. Using the maximum likelihood method (MLE), a single factor model was found to be acceptable with results at [2/df=0.227, GFI=0.999, AGFI=0.997, RMSEA<0.001, AIC=21.135].

The readiness category held two separate sub-constructs, which combined to form the full description of readiness. This analysis in Table 6 showed adequate inter-item correlation between the items in the construct ($0.3<r<0.9$). The KMO value derived from EFA was 0.846, which is very high. The single factor extracted explains 59% of variation within these items, with a minimum loading factor of 0.706 and CR value 0.833. CFA was performed using MLE, which resulted in an acceptable level of results [2/df=1.530, GFI=0.993, AGFI=0.980, RMSEA =0.034, AIC =27.649].

Table 6 Inter-item correlation and factor loading for willingness construct

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	B1	B2	B3	B4	B6	
B1	3.16	1.711	1.000	0.467	0.487	0.429	0.416	0.720
B2	3.04	1.658	0.467	1.000	0.545	0.440	0.441	0.751
B3	3.84	1.401	0.487	0.545	1.000	0.563	0.565	0.833
B4	2.89	1.660	0.429	0.440	0.563	1.000	0.509	0.768
B6	3.15	1.674	0.416	0.441	0.565	0.509	1.000	0.765

Table 7 shows the Inter-item correlation and factor loading derived from EFA for the capacity construct. In this construct, items B8 and B9 do not show an adequate correlation with at least one other item in the construct set. This led to the dropping of these items from the EFA and CFA process. However, other items (B5, B7, B10) did show an adequate inter-item correlation ($0.3<r<0.9$). In the EFA process, the KMO value was 0.651, which is lower than the previous two constructs but continues to fall into the acceptable range. A single factor extracted from these three items explained 60% of the variance within these three factors. The minimum factor loading value was 0.725, with CR value=0.750. CFA showed a single factor model that presented an acceptable result at [2/df=0.053, GFI>0.999, AGFI>0.999, RMSEA<0.001, AIC=10.053].

Table 7 Inter-item correlation and factor loading for capacity construct

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	B5	B7	B8	B9	B10	
B5	3.19	1.670	1.000	0.481	-0.040	0.011	0.364	0.801
B7	2.93	1.690	0.481	1.000	0.009	0.042	0.371	0.804
B8	2.51	0.892	-0.040	0.009	1.000	0.022	-0.021	
B9	3.07	1.751	0.011	0.042	0.022	1.000	0.016	
B10	3.28	1.664	0.364	0.371	-0.021	0.016	1.000	0.725

Organizational culture was divided into two separate constructs, policies and participation. There were 5 items in this participation construct. The inter-item correlation values, as well as the factor loadings based on EFA, are shown in Table 8. Based on the correlation coefficients, each item does correlate adequately with at least one other items in the construct (0.3<*r*<0.9). In EFA, the KMO value was 0.805, which is considered to be very good. A single factor was extracted that explained 51% of the total variation in the 5 items. The minimum factor loading value was 0.525 and the CR value was 0.831. All of these factors were thus retained and none were discarded. In CFA, a single factor model was found to be acceptable [2/df=0.693, GFI=0.997, AGFI=0.991, RMSEA<0.001, AIC=23.466].

Table 8 Inter-item correlation and factor loading for items in construct participation

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	C2	C3	C4	C7	C8	
C2	3.2170	1.70779	1.000	0.430	0.236	0.365	0.430	0.692
C3	3.0787	1.64433	0.430	1.000	0.255	0.453	0.513	0.765
C4	2.8511	1.75927	0.236	0.255	1.000	0.287	0.308	0.525
C7	3.2255	1.65725	0.365	0.453	0.287	1.000	0.519	0.753
C8	2.9511	2.93348	0.430	0.513	0.308	0.519	1.000	0.800

The inter-item correlation values and factor loadings derived from EFA for the construct policy are given in Table 9. In this set of items, all items except item C10 do correlate adequately with at least one other items in the construct (0.3<*r*<0.9). After dropping item C10, in EFA, the KMO value was 0.777, which is considered to be very good. A single factor was extracted that explained 65% of the total variation in the 4 items. The minimum factor loading value was 0.760 and the CR value was 0.799. In CFA, a single factor model was found to be acceptable [2/df=0.256, GFI=0.999, AGFI=0.997, RMSEA<0.001, AIC=16.512].

Table 9 Inter-item correlation and factor loading for items in construct policy

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	C1	C5	C6	C9	C10	
C1	3.17	1.716	1.000	0.468	0.606	0.424	0.072	0.776
C5	3.09	1.653	0.468	1.000	0.611	0.444	0.026	0.785
C6	2.74	1.532	0.606	0.611	1.000	0.590	0.070	0.885
C9	3.08	1.643	0.424	0.444	0.590	1.000	0.038	0.760
C10	2.52	1.687	0.072	0.026	0.070	0.038	1.000	

Followed by the last two separate constructs that makes up to the knowledge management discussion, Formal and Informal. There were 5 items in formal construct. The inter-item correlations and factor loadings (based on EFA) are shown in Table 10.

Table 10 Inter-item correlation and factor loading for items in construct formal

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	D1	D2	D5	D8	D9	
D1	3.31	1.660	1.000	0.396	0.097	0.404	0.409	0.712
D2	2.99	1.677	0.396	1.000	0.158	0.467	0.485	0.775
D5	2.71	1.571	0.097	0.158	1.000	0.132	0.103	
D8	3.07	1.633	0.404	0.467	0.132	1.000	0.477	0.774
D9	3.18	1.658	0.409	0.485	0.103	0.477	1.000	0.784

All items in this construct except item D5 correlate acceptably with at least one other item in the construct ($0.3<r<0.9$). In EFA (excluding D5), the KMO value was 0.776 (a very good value). A single factor extracted explained 58% of the total variation in these four items. The minimum factor loading value was 0.712 and the CR value was 0.800. In CFA, a single factor model was found to be acceptable [2/df=0.049, GFI>0.999, AGFI=0.999, RMSEA <0.001, AIC=16.098].

As for the informal construct, all items in this construct except item D3 demonstrated adequate inter-item correlation with at least one other item in the construct ($0.3<r<0.9$). EFA was performed after dropping item D3, and it showed a KMO value of 0.764 (which is seen as very good). A single factor was extracted explaining 65% of the total variation within these four items. Minimum factor loading was 0.765, with CR value 0.799. In CFA, a single factor model was found to be acceptable at [2/df=0.171, GFI>0.999, AGFI=0.998, RMSEA<0.001, AIC=16.342]. The details are shown in Table 11.

Table 11 Inter-item correlation and factor loading for items in construct informal

Item	Descriptive		Inter-item correlation					Factor loading
	Mean	Std. Dev.	D3	D4	D6	D7	D10	
D3	3.0894	1.68415	1.000	0.084	0.111	0.070	0.071	
D4	3.0064	1.70349	0.084	1.000	0.617	0.440	0.442	0.773
D6	2.7426	1.56579	0.111	0.617	1.000	0.605	0.638	0.899
D7	3.0489	1.63639	0.070	0.440	0.605	1.000	0.437	0.765
D10	3.2532	1.65646	0.071	0.442	0.638	0.437	1.000	0.781

6. Conclusion

This study has successfully answered both the research questions. Firstly, the qualitative approach determined how organisational culture affects readiness for technology transfer. Secondly, it also gathered the elements of organisational culture affecting readiness for technology transfer. This study has endeavoured to create a conceptual model with the factors as constructs and hypotheses to relate them to each other. Internal reliability of the statistical test for a given sample, revealed the reliability of the instrument. Furthermore, with the validity assessment conducted, it appears to be that the factors identified are highly correlated. Based on the results obtained, this study can further proceed with analysis of the conceptual model and testing of the resultant hypotheses with the use of SEM.

References:

Agmon, T. & von Glinow, M. A.. (1991). *Technology transfer in international business.* New York: Oxford University Press.

Bhatt, G. D.. (2002). Management strategies for individual knowledge and organizational knowledge. *Journal of Knowledge Management, 6*(1), 31-39.

Bounfour, A.. (2003). *The management of intangibles.* London: Routledge.

Chandler, G., Keller, C. & Lyon, D.. (2000). Unravelling the determinants of an innovation-supportive organisational culture. *Entrepreneurship: Theory and Practice, 25*(1), 59-72.

Cohen, G.. (2004). *Technology transfer, strategic management in developing countries.* Thousand Oaks CA: Sage Publications.

Cui, A., Griffith, D., Cavusgil, S. & Dabic, M.. (2006). The influence of market and cultural environmental factors on technology transfer between foreign MNCs and local subsidiaries: A Croatian illustration. *Journal of World Business, 41*(2), 100-111.

Daghfous, A.. (2004). Absorptive capacity and the implementation of knowledge-intensive best practices. *SAM Advanced Management Journal*, *69*(2), 21-36.

Easterby-Smith, M., Snell, R. & Gherardi, S.. (1998). Organization learning: *Diverging communities of practice? Management Learning, 29*(3), 259-272.

Foss, S.. (2005). *Strategy, economic organization and the knowledge economy.* Oxford: Oxford University Press.

Gopalakrishnan, S. & Santoro, M.. (2004). Distinguishing between knowledge transfer and technology transfer activities: The role of key organizational factors. *IEEE Transactions on Engineering Management, 51*(1), 57-69.

Hofstede, G.. (1991). *Culture and organizations: Software of the mind.* London: McGraw-Hill.

Ishida, S.. (2004). Composite knowledge for high-tech corporations. In: Benton, C. & Richter, F. (Eds.), *Meso-organizations and the creation of knowledge*. Westport CT: Praeger, 37-60.

Kallil, O., Caudio, A. & Seliem, A.. (2006). Knowledge management. *SAM Advanced Management Journal, 71*(3), 34-47.

Kasimin, H., Ibrahim, H. & bin Yusoff, M.. (2009). Diagnosing an ongoing technology transfer process: An approach based on ANT. *International Journal of Networking and Virtual Organizations, 6*(1), 47-63.

Kumar, N. & Marg, L.. (2000). Foreign direct investment and technology capabilities in developing countries: A review. *Journal of Public Administration, 23*, 1253-1278.

Leonardi, P.. (2008). Indeterminacy and the discourse of inevitability in international technology management. *Academy of Management Review, 33*(4), 975-984.

Miller, B., Bierly, P. & Daly, P.. (2007). The knowledge strategy orientation scale. *Journal of Managerial Issues, 19*(3), 414-435.

Milutinovic, V. & Patricelli, F.. (2002). *E-business and e-challenges.* Amsterdam: IOS Press.

Ouma-Onyango, R.. (1997). *Information resources and technology transfer management in developing countries.* London: Routledge.

Oztemel, E. & Polat, T.. (2007). Technological readiness model for enterprises. In: Pham, D., Eldukhri, E. & Soroka, A. (Eds.), *Intelligent production machines and systems*. London: Elsevier.

Saint-Onge, H.. (1996). Tacit knowledge: The key to the strategic alignment of intellectual capital. *Strategy and Leadership,* March/April,10-14.

Samli, A.. (2002). *In search of equitable, sustainable globalization.* Westport CT: Quorum Books.

Samli, A.. (1985). Technology transfer: The general model. In: Samli, A. (Ed.), *Technology transfer: Geographic, economic, cultural and technical dimensions*. Westport CT: Quorum Books, 3-17.

Schein, E. H.. (1998). Three culture of management: The key to organizational learning. *Sloan Management Review*, 9-20.

Simon, F. & Lane, P.. (2004). A model of cultural differences and international alliance performance. *Journal of International Business Studies, 35*, 306-319.

Simonin, B.. (2004). An empirical investigation of the process of knowledge transfer in international strategic alliances. *Journal of International Business Studies, 35*(5), 407-431.

Sonnentag, S.. (2002). *Psychological management of individual performance.* New York: John Wiley & Sons.

Sundbo, J. & Fuglsang, L.. (2002). *Innovation as strategic reflexivity.* London: Routledge.

Syed-Ikhsan, S. & Rowland, F.. (2004). Benchmarking knowledge management in a public organisation in Malaysia. *Benchmarking: An International Journal, 11*(2), 238-266.

Taylor, S. & Bogdan, R.. (1998). *Introduction to qualitative research methods.* New York: John Wiley.

Triandis, H.. (1994). *Culture and social behavior*. San Francisco: McGraw Hill.

Trice H. M. & Beyer J. M.. (1993). *The cultural of work organization*. Englewood Cliffs, NJ: Prentice Hall.

Wengraf, T.. (2001). *Qualitative research interviewing.* London: Sage.

(Edited by Ruby and Chris)