

**Scales Construction for Organisational Variables that Influence the Use Of ICT
for Global Planning**

Abel Usoro

University of the West of Scotland, UK

abel.usoro@uws.ac.uk

Abbas Abid

University of the West of Scotland, UK

abbas.abid@uws.ac.uk

Matthew Kuofie

Central Michigan University, USA

Kuofilm@cmich.edu

ABSTRACT

Research literature has identified organisational factors as significantly affecting the use of information technology generally. Nonetheless, there is neither a conclusive study on the organisational factors that would affect the use of information technology for global planning nor developed scales for measuring these factors. Using literature analysis, organisational factors have been conceptualised as global stance, structure, top management support, economic sector, age and size of organisation. A survey of 167 respondents to a 44-item questionnaire has been conducted to endeavour to establish the validity and reliability of measures for these concepts. Data analysis indicates high reliability and validity of the scales developed. Apart from one item which should be dropped from the scales, the rest of the items that were subjected to

statistical test are proved adequately valid and reliable for future studies that should among others establish the significance of influence of the factors and their relationship to the use of ICT for global planning. The findings and implications are presented.

Keywords: Internal Consistency, Reliability, Validity, Organisational Factors, Planning Tools; Measures For Organisational Factors

INTRODUCTION

A review of relevant literature suggests that organisational context or factors have significant bearing on the success of information systems (cf Gray *et al*, 1997, pp 112-24; Goulielmos, 2003). For example, Ramasubramanian (1999) in his study of geographical information systems (GSI) in developing countries found strong links between organisational factors and success of GIS implementation. Also, Doherty and King (2002, pp 147-60) concluded after their survey of 600 senior information systems (IS) executives that organisational issues should be given more attention than technical issues when developing information systems.

Organisational factors have been studied under widely varied contexts, e.g. workers' attitude and commitment, health and safety, work stress, and implementation of information and communication technology (ICT) systems (cf Pepper *et al*, 2001; Rasmussen *et al*, 2001, pp 157-64; Sola *et al*, 2000, p 145-52; Taylor *et al*, 1999, pp 21; Chand and Sethi, 1977, p 453; Zdunczyk and Blenkinsopp, 2007; Booth and Hamer, 2007; Haar and Spell, 2008). It is perhaps therefore understandable that there is no single categorization of "organisational factors." Torp *et al* (2001, pp 1328-38) for instance categorized them into job demands, decision authority, social support,

and management support related to health, environment, safety; whereas Koustelios (2001, pp 627-34) included the job itself, job satisfaction, promotion, role conflict and role ambiguity in his list of organisational factors. Grover and Segars (1996, p 12) have noted differences in the definition and operationalization of organizational factors in management information systems (MIS) studies. They argue that these differences account for the inconsistency in study findings. This paper defines organisational factors taking into consideration their logical relevance to the context of the use of ICT for global planning. Literature suggests global stance, structure, top management support, economic sector, size and age as relevant organisational factors. The rest of this paper will present (a) a discussion of how these factors are conceptualized from literature (b) how measures were developed and tested for these concepts, and (c) conclusion and areas for future research. The terms “measures” and “scales” are used interchangeably in this paper.

ORGANISATIONAL FACTORS USED IN THIS STUDY

Before presenting a research framework and operationalizing it, this section uses existing literature to conceptualise the organisational factors of global stance, structure, top management support, economic sector, size and age. Also, the use of ICT for global planning as a factor is also conceptualised in this section.

Global Stance/Strategic Style

To establish “strategic intent” and set major objectives, an organisation needs to define and clarify its mission and philosophy. An organisation’s philosophy should include its global stance or posture, i.e., ethnocentric, polycentric, regiocentric, geocentric or some mixture of these viewpoints (cf Holt, 1998, p 236; Rugman and

Hodgetts, 1995, p 215; Buckley, 1998, p 13; Özsomer, Calantone and Bonetto, 1997). An ethnocentric stance places emphasis on the country of origin, for example, in personnel issues (Hill, 1998; Muratbekova-Touron, 2008). Polycentric view localises business in each global location, while regiocentric position does the same for trade regions e.g. EC. The geocentric philosophy emphasises total globalization or standardisation of goods, services and practices with little or no adaptations to local needs. Jeannet (1999, p 28) has described companies' stance along the ethnocentric and geocentric continuum as a “global mindset” that will determine how successful global managers plan. This research takes the issue further by querying the effect of the mindset on the use of information technology in planning. The closer an organisation is to the ethnocentric end, the less perhaps should be the level of globalization; and the closer it is to the geocentric end, the higher should be the level of globalisation. Does the level of globalisation co-relate positively with the use of global planning technologies?

Another approach to viewing strategic style is the perceived alignment of strategic goals with information systems for global planning (Ang *et al*, 2001, pp 159-74). A related important factor also is the level of involvement in global planning. Do companies with better alignment of IS and strategic goals, and do those that are more involved in global planning tend to use information technology more? Answers to questions raised in this section cannot be satisfactorily attempted without a reliable and valid measure for global stance.

Structure

Structure has been noted as an important organisational variable that affects information systems implementation (cf Gray *et al*, 1997, pp 112-24; Morton, 1991; Alshawi and Goulding, 2008). Ives, Jarvenpaa and Mason (1993, p 547) discovered a poor fit between organisational structure and global information technologies. Ein-Door and Sege (1978, pp 1067-77) have reported significant correlation between organisational structure and MIS structure. They, as well as Grover and Segars (1996, p 14), defined structure in terms of the level of centralisation or decentralisation or decision making existing in the organisation. Centralisation and decentralization refers to the level of delegation of authority and decision-making in the organization (Thompson, 2001, p 722).

In management literature, structure is also defined in terms of the vertical and horizontal shapes of an organization (Jones, 2001, 62-75). A “tall” organization has a high vertical shape, i.e. many hierarchical levels, whereas a “flat” organization is the opposite. Organisations, especially those responding to global pressures, are noted to be increasingly preferring flat and horizontal structures that arranges workers into teams with greater divulging of powers to each employee (Daft, 2001, pp 108-9). That way, there is greater decentralization, more effective communication and rapid response to customer and environmental changes.

Current changes affect not only internal (just described) but also the external structures of organizations. With regards to external structures, Wright and Burns (1998, pp 9-10) in their empirical study found out that some of these organizations were changing to virtual structures. Their strategic objectives are to maximise flexibility and adaptability to environmental changes, develop a pool of competencies

and resources, reach a critical size in accordance to the dictates of the market, and optimise the global supply chain (Martinez *et al*, 2001, p 226). Virtual organisational structures combine multiple enterprises within the whole value chain and collaborative working is the glue that binds these enterprises together (Bowles, 1994, pp 12-28; Walters and Rainbird, 2007). Thus, a virtual organisation shares power and information (typically with the use of ICT) with its partners whom it depends for collaboration (cf Hagel and Armstrong, 1997; and Moller, 1997, p 39).

Flat, decentralized, horizontal and virtual structures rely immensely on effective communication, participative decision making and planning which ICT has a significant potential to provide. Would we therefore expect to observe more use of ICT for planning in organizations that are flat, decentralized and virtual? This stage of the research is not providing answers but constructing measures for these important variables.

Top Management Support

Top management support is essential for successful implementation of an information system (cf Ash, 1997, pp 102-11; Collins, 2001; Dong, 2008). Support by way of training and provision of finance, equipment and other resources should encourage employees to accept and use ICT effectively. It would be interesting to find out whether this is the case with ICT for global planning. The scales developed in this study operationalise top management support in terms of the training and the other supporting provisions.

Economic Sector

Many MIS researchers have included economic sector as an organisational factor in their study of information systems success and have found mixed results with regards to its significance (cf Grover and Segars, 1995, pp 9-25; Mason and Mitroff, 1980, pp 908-19; Ein-Dor and Segev, 1978, pp 1067-77). Economic sectors differ in terms of their history and exposure to environmental influences and this difference may affect their level of need to plan globally and to use ICT for planning purposes. The computing industry would likely perceive more need for the use of ICT for planning than some medical industry, such as dentistry, would. The empirical study proposed for future study is to first investigate whether there are differences among economic sectors in the use of ICT for global planning before exploring why the differences may exist. Meanwhile, this study includes economic sector in its scale development.

Age

The length of period an organisation has existed can have conflicting effects on the use of ICT for global planning. On the one hand, long years of existence may suggest stability, experience and ability to successfully implement a global information system as well as the ability to train and motivate its members to use the system. Conversely, age may mean lethargy to change such as could be brought about by the implementation of a global information system. The question here is whether the use of ICT for global planning co-relates with years of an organisation's existence.

Size

Small organizations are generally in worse economic situations than large ones are (Grubisic and Goic, 2000). Consequently, they may be limited in their financial ability to provide information systems that would link their key decision makers and

provide them with the tools necessary for effective global planning. Larger firms are more likely to possess greater financial, human and technological resources to successfully implement information systems (Mason and Mitroff, 1980, pp 908-19; Ein-Dor and Segev, 1978, pp 1067-77). On the other hand, the smallness of an organisation may become an incentive to use global information systems to compete with their large counterparts. This is supported by the finding of a pilot study by Usoro (2002, pp 136-49). To reconcile this finding with our discussion in this section, it may be that the variation in the financial ability of small firms is the moderating factor. Therefore, along with size, the resources of organisations should be investigated as a factor that affects the use of IT for global planning. An indirect approach to investing resources could be the level of financial and equipment support given by top management.

Use

The actual use of ICT is recognised both by practitioners and academic as crucial to the derivation of the potentials of ICT. Thus, there are many ICT usability studies in MIS. On the whole, most studies measure use in terms of the length of time spent on ICT (cf Ho and Lee 2001, pp 258-66). Interestingly, recent studies have gone beyond this to try to capture the effectiveness of the use. For instance (Melone 1990) argue for the inclusion in the usability measure of 'performance-related' usage behaviours that reflect how IT is actually used. Doll and Torkzadeh (1998) used this approach to develop and operationalise a system-use construct based on a unidimensional measure of decision support, work integration and customer service. As they rightly note, no single taxonomy may be appropriate for all purposes and applications. Therefore, for the ICT usability in global planning, the taxonomy has to be relevant to global

planning. From literature, the key areas that ICT use is applicable to global planning are:

- quickly identifying internal strengths and weaknesses,
- performing environmental scanning,
- bridging the geographical distance between planners, and
- simplifying the planning process.

Competitive advantage has been strongly linked to internal resources and capabilities (cf Kay, 1993, pp 17-37; Penrose, 1963). These resources and capabilities are discovered by organizational audit which is part of the first stages of planning. The required information is typically distributed throughout the organization. If this information is in electronic form and the information systems are compatible, the information can be pooled together irrespective of distance. The Internet technology along with developments in enterprise information systems (eg SAP) presents the potential for achieving these aims. Without going into much detail, it is worth mentioning that the recent developments in the Internet communication language, such as XML (eXtensible Markup Language), makes possible the exchange of more meaningful information and Internet data can more easily be transferred to and from an organization's database. Thus, information can be classified, analyzed and presented at greater speed. This capability can of much use when scanning the environment.

Environmental, e.g. economic, changes tend to be the most disruptive to global planning efforts (Chae and Hill, 1996, pp 880-91). It is therefore important that

environmental scanning is constantly performed to monitor political, social, technological, economic, and market changes. Not every change is relevant to every organization. The relevant ones need to be quickly identified and acted upon. There are a number of Internet based technologies and applications developed to perform these tasks. Apart from XML already mentioned, Fletcher and Donaghy (1994, pp 4-18), for instance, write about computer systems for monitoring of competitors' moves. Groupware technologies make possible the linking of planners distributed around the globe. It provides electronic conferencing and enables users to share the same source of information and exchange ideas. It is interesting that Fulmer and Sashkin (1995, 26-31) considered groupware also as an essential tool for global learning organizations.

Sokol (1992) discovered that simplifying the strategic planning process yielded benefits. These benefits include saving time in developing a plan and shortening the lead time to implement it, making the plan easier to understand, focusing better on only the most relevant business issues, and assembling a more consistent strategy for the whole company.

It is implicit in the foregoing that ICT should simplify the planning process. Moreover, business and planning models such as the SWOT, PEST and Porter's Value Chain and 5-point models can be built into ICT, thereby simplifying and quickening the processing of information (Rugman and Hodgetts, 1995, pp 218, 221-2). The presentation facilities of ICT make possible the display of information from different perspectives and the ability to easily jump between a highly summarized view and detailed information. ICT make possible the capturing and management of

organizational knowledge needed for global planning. With the simplification of the global planning process, a relatively small business should be able to enter the global market with ease (Tetteh and Burn, 2001).

This study uses the four dimensions discussed in this section and summarised in Figure 1 to measure usability of ICT for global planning.

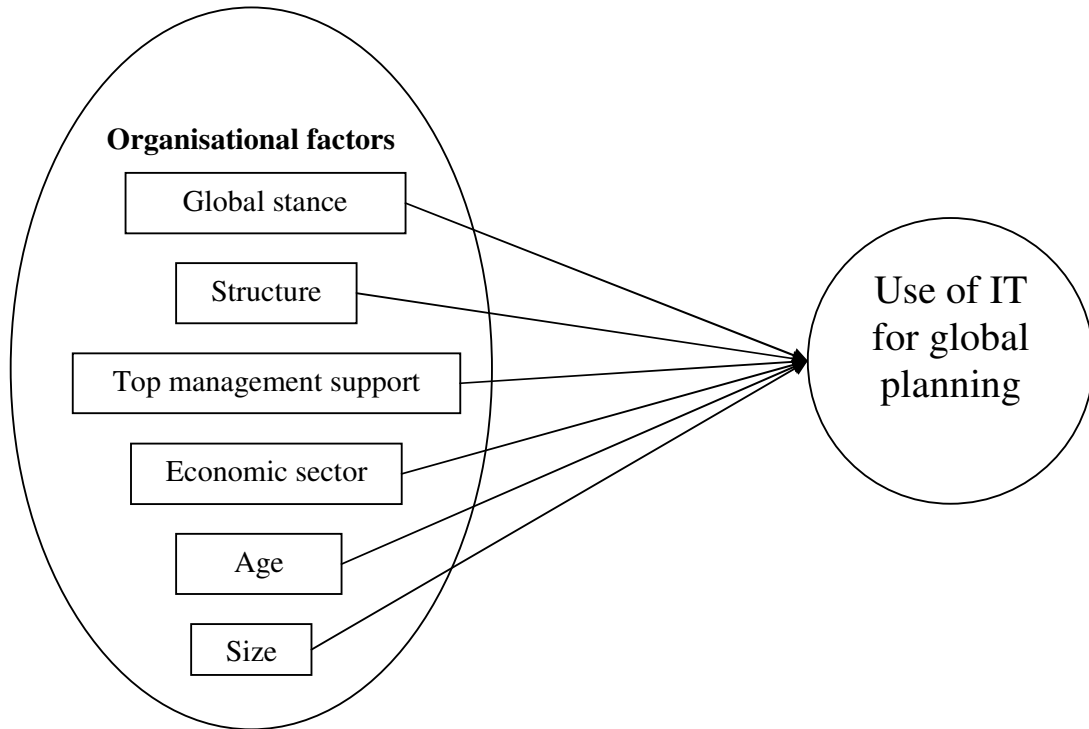


Figure 1: Theoretical framework

METHOD

As a general approach, this study inclines to the positivistic research approach and uses survey method¹. Firstly, following the conceptualising of the framework (in Figure 1) from literature, the constructs in the framework were carefully operationalized as shown in Figure 2 below. Questionnaire items were then created

¹ Survey is a valid positivistic method to research. It need not be simply descriptive but also analytical where relationships between variables can be evaluated provided the underlying theory that contains the variables has been established (Peil, 1982).

based on the definitions. The table in Figure 2 maps the definitions to the questionnaire items in the Appendix. Information on sampling and statistical analysis that evaluates the reliability and validity of the developed measures are contained in subsequent sections of this paper. Meanwhile, it is important to conclude by pointing out that the objective of the research at this stage is not to answer the questions raised in section 2 but to develop measures of constructs required to perform future studies to answer those questions.

Construct	Component	Definition	Questionnaire item(s)
Global Stance	Geocentric/polycentric	Standardisation of products, services and practices irrespective of the country we operate in.	B08
	Ethnocentric	Global standards are tailored to the standards at original home country.	B09
	Regiocentric	Business operation is focused in a single trade region (eg EC) only.	B10
	Involvement in global planning	Searching for business opportunities in more than country.	B11
		In planning, taking into consideration events (eg economic and social) which occur outside one country's boundaries.	B12
Alignment of information systems with strategic goals	Alignment of information systems with strategic goals	B13	
Structure	Centralisation vs decentralisation	Level of delegation of authority and decision-making in the organisation	B14
	Shape: vertical vs horizontal	Number of levels of management	B04
		Number of employees	B05
	Virtual	Sharing power with stakeholders – customers and suppliers	B15
		Reliance on sharing information with collaborating organisations or stakeholders	B16
		Reliance on collaboration with partners	B17
		Reliance on IT to collaborate with partners	B18
Frequent change of the structure of our organisation as a result of changes in customer demand and contributions of collaborating organisations.	B19		
Top management	Adequate training	B20	
	Adequate computing equipment	B21	
	Adequate financial and other support	B22	
Economic sector	Type of business	A01	
Age	Years in business	B02	
Size	Number of countries operated in.	B03	
	Number of employees	B05	
Finance (Likely to be difficult to measure turnover and net worth with a survey. Should be easier with an in-depth study)	Turnover	Turnover	B06
	Net worth	Net worth	B07
	Adequate computing equipment (indirect measure)	Adequate computing equipment	B21
	Adequate financial and other support (indirect measure)	Adequate financial and other support	B22
Use	Frequency		D01 – D05
	Functional	Identification of internal strengths and weaknesses	E01
		Performing environmental scanning to identify opportunities and threats	E02

		Collaborating with your colleagues in the planning process	E03
		Simplifying the planning process eg support for using your business model to perform statistical analysis for you or support for building scenarios and making “if-then” analysis.	E04

Figure 2 – Operationalisation of constructs

SAMPLE

Managers in UK and MBA students who came from managerial positions were randomly selected to complete questionnaires. Because of the closeness of strategic planning to global planning, the first question asked respondents whether they are engaged in strategic planning. We considered those who answered in the affirmative as mostly likely to use information systems for some aspects of global planning since global planning is part of strategic planning. 181 questionnaires were returned by participants from manufacturing and services sectors, after eliminating respondents who were not involved in strategic planning and also badly completed questionnaires, the usable ones were 167 as demonstrated by Figure 3. A sample size of at least 150 is generally sufficient for scale development (Hinkin, 1995; Stone, 1978).

Anonymity was maintained in the completion of the questionnaire; only when the respondents needed to receive feedback from the study did they need to state their names and addresses.

Type of organisation	Frequency	Percent
Financial services	18	10.8
Law, Property	7	4.5
Education, training	17	10.2
Healthcare, Medical, Pharmaceutical	12	7.2
Manufacturing, Engineering,	16	9.6
Telecommunications	11	6.6
Retail, Wholesale, Logistics, Transport	25	15.0
Oil, Gas, Mining, Utilities, Energy & Water	14	8.4
Media, Leisure, Travel, Marketing, Advertising,	19	11.4
Information Technology , computing	13	7.8
Other type of businesses	15	9.0
Total	167	100.0

Figure 3 - Profile of respondents

DEVELOPMENT OF MEASURING INSTRUMENT

There are varied definitions and operationalization of organizational factors in MIS studies (Grover and Segars, 1996, p 12; Hinkin, 1995); but this study is the first at endeavouring to measure organisational factors taking into consideration their logical relevance to the context of the use of ICT for global planning. Thus, rather than accumulate existing measures, literature was used to conceptualise organisational factors from the scratch. Hence, literature provided construct validity to the items used in measuring the variables, i.e. the organisational factors. The development of measures for these variables followed three sequenced stages: item creation, scale development and instrument testing.

Item Creation

Item creation is normally the first issue to address in construct validation of a new measure (Schriessheim *et al*, 1993); and the primary concern at this stage is to achieve content validity and to establish a clear link between items and their

theoretical domain (Moor & Benbasat, 1991; Hinkin, 1995). Each of the constructs (see Figure 2 and Appendix I) was carefully defined in line with their conceptual logic and as supported in literature. Such definition sometimes results in decomposition of constructs. For example the construct “global stance” was defined and broken into five components which included “ethnocentric” and “regiocentric” before statements were composed to define the subcomponents. The items used are in Figure 2. Some construct components, such as “virtual” (structure) had multi-definitions each of which resulted in a questionnaire item. Figure 2 shows the complete mapping of the constructs to the components, their definitions and the questionnaire items.

Scale Development

Multi-scale items were created along with a balanced Likert seven² point scale (strongly agree to strongly disagree, or no extent to great extent) to measure the constructs: global stance, structure, top management (support) and use (of ICT for global planning). Consideration was given to the use of negatively worded questions to reduce pattern response bias; but we decided not to use them because of the counter argument that they can introduce systematic error (Schriesheim & Hill, 1981; Jackson et al, 1993).

Some items employed “Yes” and “No” format; and some others, multiple choice with more options, for example item B02 below:

² We chose 7-point rather than 3-point for instance to provide adequate variance between respondents and more accurate measure.

B02 *Approximate years in business (please tick an appropriate option):*

<i>Less than 1</i>	
<i>1 – 10</i>	
<i>11 – 20</i>	
<i>21 – 30</i>	
<i>31 and above</i>	

Open ended items were also used, for example B03 below:

B03 *Number of countries your organisation operates in*

Scale length for most organisational variables under investigation ranged from 3 items for "top management support" (B20-B22) to 6 items for "structure" (B14-B19) and "global stance" (B08-B13). It is also the concern of scale development to ensure that the number of questionnaire items is neither too few to be inadequate or too many to cause tiredness-induced response bias (Cook et al., 1981; Carmines & Zeller, 1979). This concern was kept in mind when arriving at the items number which eventually came to 44.

Instrument Testing

An instrument is tested for both validity and reliability. Validity refers to the degree to which a study accurately assesses the specific concept that the researcher is attempting to measure. Lacity and Jansen (1994) define validity as making common sense, and being persuasive and appear right to the reader. So validity is concerned with the study's success at measuring what the researcher set out to measure. Reliability, in the other hand, is concerned with the accuracy of the actual measuring instrument. It is concerned with questions of stability and consistency of the measuring instrument when repeated over time.

Instrument validity

As discussed previously the variables were derived and constructed based on related literature and validation was carried out by various rigorous steps. Initial validation for the study variables was performed by informal discussion with relevant academic staff involved in management, business and information systems courses to obtain their feedback and suggestions for modifications.

Further content validation was conducted through pilot-testing: the questionnaire was administered with a combination of interviews to and self-completion by postgraduate students (MBA) most of whom had worked as managers. Informal discussions and pilot-testing revealed positive and negative aspects of the items, and this helped in shaping items needing change to enhance clarity of the final version. Questions that were ambiguous and confusing were removed, rewritten, or replaced. The care in the design and creation of the instrument enhanced validity (Huitt, 1998).

Instrument Reliability

There are four basic types of reliability: (1) stability reliability (test-retest reliability), (2) equivalency reliability (split-halves reliability), (3) internal consistency, and (4) inter-rater reliability (Carmines & Zeller, 1979; Huitt, 1998; Kirk & Miller, 1989; Ryser, 1994; Thompson & Daniel, 1996; Yin, 1989). The most common statistical methods for these types of reliability investigation is Cronbach's Alpha model (Cronbach's α). Cronbach's Alpha investigates how well a set of variables measure a single unidimensional underlying construct. When data have a multidimensional structure, Cronbach's Alpha will usually be low. Cronbach's alpha is not a statistical test but rather a coefficient of reliability or consistency. Cronbach's Alpha can be

written as a function of the number of test items and the average inter-correlation among the items. For conceptual purpose, below is the formula for the Cronbach's Alpha:³

$$\alpha = N\bar{r} / [1 + \bar{r}(N - 1)]$$

N is equal to the number of items and r-bar is the average inter-item correlation.

From this formula, one can see that if the number of items increases, then Cronbach's alphas increase. Moreover, if the average inter-item correlation is low, Alpha will be low. As the average inter-item correlation increases, Cronbach's Alpha increases as well. For the purpose of reliability analysis for this study, Alpha coefficient was performed by correlating all the scores on individual items, with the overall score on the test. Tests with high reliability will achieve an Alpha coefficient of 0.70 or more on a scale of 0 to 1 where a high score indicates high reliability (Hair *et al*, 1998).

Exceptions to the rigorous statistical tests are items related to financial aspects (B06 and B07) because they did not yield much response. These need to be revisited and perhaps with the use of case studies, it may be easier to get these values by inspecting financial records. Age (years in business), size and economic sector each were measured by one item and therefore need not be subjected to rigorous validity and reliability tests. Nonetheless, they are useful variables for future studies.

Stability reliability

This stage of instrument development aimed to test the scale stability. To determine stability, the same measure is repeated on the same group of participants (Test-retest)

³For more details on Cronbach's' Alpha, See: Carmines E. and Zeller R., 1979; SPSS library: My Coefficient Alpha is Negative.

after a period of time. Results are compared and correlated with the initial test to give a measure of stability. Pilot-testing was conducted as mentioned previously. Test-retest in pilot-testing was performed after 5 weeks from completing the first questionnaire by the 21 participants. The correlation coefficient between the two reliability tests (see Table 2) revealed that the instrument tools are reliable and stable. If the scores are relatively stable across repeated testing, this leads to the conclusion that the instrument is measuring something in a consistent and generalisable way (Wiersma, 1991).

Variables	No. of items	Alpha Pilot 1	Alpha Pilot 2
Overall organisational factors	15	0.77	0.83
Use of IT / functional	4	0.95	0.95
Use of ICT / frequency	6	0.73	0.81
Global Stance	6	0.81	0.82
Structure	6	0.71	0.78
Top management support	3	0.75	0.74

Table 2 Reliability Coefficient from Pilot 1 and 2 Test-Retest

Equivalency reliability (Split-Halves)

In this test the total set of items is divided into halves and the score of each halve are correlated to obtain the reliability. Table 3 demonstrates the Split's alpha reliability.

Variables	Alpha half 1	No. of items	Alpha half 2	No. of items	Correlation between parts
Overall organisational factors	0.717	8	0.720	7	0.57
Use of IT / functional	0.890	2	0.879	2	0.89
Use of ICT / frequency	0.581	3	0.562	3	0.82
Global Stance	0.957	3	0.720	3	0.75
Structure	0.761	3	0.521	3	0.72
Top management support	N/A*				

* Not applicable because variable has only one item in one of the halves

Table 3: Split-Halves Reliability Coefficient

While split-halves is commonly used to measure reliability, its weakness is that the correlation between the halves may differ somewhat depending on how the total number of items is divided into halves (Carmines & Zeller, 1979, pp 50). This is noticeable from the findings in Table 2 concerning global stance (α part1: 0.96, α part2: 0.72) and organisational structure (α part1: 0.76, α part2: 0.52). Thus, we use other measures of reliability to complement split-halves.

Internal consistency

Internal consistency measures do not require split-halves or test-retest reliability, but requires a single test to provide the estimate of reliability for the given test (Carmines & Zeller, 1979, p.44). Internal consistency of items reflects the reliability of a measuring instrument because internal consistency assures that the items within each scale are achieving their measurement purposes with relative absence of error. The focus here is on the extent to which respondents are consistent in how they answer questions that are related to each other. The procedure to test the internal consistency is by using Cronbach's alpha model (Cronbach's α).

Frequency, means and standard deviation for individual items were examined to test the spread of responses. Internal consistency test of the subscales were conducted to ensure that the items within each scale are achieving their measurement purposes. The alpha outcomes (Cronbach's α) are presented in Table 4. The findings indicate that all Cronbach's alphas are 0.72 or over. Overall organisational factors (variables B08 – B22) show an internal consistency of 0.78 (Cronbach's α). This high coefficient indicates that the proportion on internal individual scores variance can be

reliably attributed to individual differences among the respondents. In other words, Cronbach's Alpha shows the inter-scale reliabilities, which assures us that the items within each scale are measuring consistently the factors selected for this study.

Regarding the extent of use of ICT to achieve organisational tasks (variables E01 – E04), the internal consistency reliability (Cronbach's α) is 0.92, while the other variables for using ICT for global planning (D01-D05) shows an internal consistency of 0.76. Finally, the findings in Table 4 provide a strong support for the internal consistency of all organisational factors sub-scales.

Variables	Mean	Standard Deviation	Raw Alpha ⁴ (Cronbach's α)	Standardised Alpha ⁵	No. of Items
Overall organisational factors (B08-B22)	4.90	1.656	0.782	0.779	15
Use of ICT for global planning / Functional(E01-E04)	4.02	1.981	0.921	0.922	4
Use of ICT for global planning / Frequency(D01-D05)	3.77	1.824	0.762	0.730	5
Global Stance(B08-B13)	4.94	1.657	0.732	0.724	6
Structure (B14-B19)	5.10	1.505	0.772	0.759	6
Top Management Support(B20-B22)	4.40	1.463	0.773	0.772	3
Years in Business (Age)			N/A ⁶		1
Size			N/A		1
Economic Sector			N/A		1

Table 4: Internal consistency reliability coefficient

⁴ Raw alpha is based on item correlation. The stronger the items are inter-related, the more likely is the test consistent.

⁵ Standardized alpha provides information on how each item reflects the reliability of the scale; it is based upon item covariance. Variance is a measure of how a distribution of a single variable (item) spreads out. Covariance is a measure of the distributions of two variables. The higher the correlation coefficient is, the higher the covariance is. [for more details see Afifi and Elashoff (1966)].

⁶ Not applicable because factor had only one item question.

Factor analysis

The existence of a high alpha coefficient is a useful indication of high reliability but it does not assure us that item loadings are caused by the influence of only one latent variable (DeVellis, 1991). Such a coefficient does not point to the factorial structure and, therefore, the number of variables that influence the items. Yet, a number of studies indicate that a low internal consistency results when items that do not load as predicted are retained in a measure (Hinkin, 1995). Factor analysis is the most frequently used systematic technique for data reduction and refining constructs to ensure that item loadings emanate from a single latent variable. Varimax factor analysis identifies groups of items that have variance in common to check whether the items clustered according to the intended scales.

The findings in Table 5 indicate that the items clustered around five factors (for details of loading matrix see Appendix II) which are the intended constructs that were measured. According to Hinkin (1995), 0.40 is the cut-off point for acceptable item loading, though sometimes items could still be retained in a construct if they load as little as 0.30 on a specified factor. B19 is supposed to load on factor 2 and in that factor it is only 0.165 which is lower than the cut-off point. Besides, B19 also shares loading in factors 3, 4 and 5. This suggests that B19 should be dropped from the scale. The rest of the items load higher than the 0.40 water mark.

In conclusion, except item B19 that needs to be dropped, factor analysis has proved that the scales developed to measure the constructs of this study are valid and reliable.

Variables	Mean	SD	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
D01	5.89	1.31	.407				
D02	4.05	1.98	.863				
D03	8.82	1.91	.816				
D04	4.38	2.07	.802				
D05	3.61	1.77	.790				
E01	4.07	1.95	.868				
E02	3.77	1.91	.850				
E03	4.53	2.11	.840				
E04	3.74	1.81	.873				
B14	5.04	1.50		.431			
B15	4.84	1.54		.604			
B16	5.23	1.46		.862			
B17	5.10	1.61		.862			
B18	5.28	1.32		.679			
B19	5.15	1.18		.165			
B08	4.98	1.64			.914		
B09	4.95	1.65			.941		
B10	4.76	1.52			.941		
B20	4.40	1.43				.734	
B21	4.43	1.31				.781	
B22	4.40	1.42				.840	
B11	4.86	1.52					.928
B12	5.14	1.37					.472
B13	5.01	1.43					.916

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Table 5: Factor analysis with loading of items on their intended constructs

Finally, Principal Component Analysis was performed to examine whether there is one general factor underlying all the created items in the developed instrument. The findings indicate that all 24 items had a substantial loading (0.67 – 0.94) on one principal component, except item B19 (Table 6). It indicated that the developed instrument could justifiably be used as a single measure of organisational variables which influence the use of ICT for global planning.

Variables	Communalities	
	Initial	Extraction
D01	1.00	.792
D02	1.00	.766
D03	1.00	.881
D04	1.00	.760
D05	1.00	.744
E01	1.00	.803
E02	1.00	.735
E03	1.00	.748
E04	1.00	.802
B14	1.00	.780
B15	1.00	.670
B16	1.00	.794
B17	1.00	.762
B18	1.00	.720
B19	1.00	.380
B08	1.00	.882
B09	1.00	.912
B10	1.00	.937
B20	1.00	.697
B21	1.00	.720
B22	1.00	.736
B11	1.00	.872
B12	1.00	.752
B13	1.00	.841

Table 6 Principal Component Analysis

CONCLUSIONS AND AREAS FOR FURTHER STUDIES

While earlier research suggests that organisational factors significantly affect the use of information technology, no conclusive study on organisational factors has been done with regards to the use of ICT for global planning. The investigation of this paper focused on two issues. The first was the determination from literature of factors that would influence the use of ICT for global planning. The second was to develop measuring instrument to operationalize these factors and determine the validity and reliability of this instrument.

Literature review was used to develop a research framework that conceptualized organisational factors of global stance, structure, top management support, economic sector, age and size of organisation; as well as the use (of ICT for global planning). These factors were operationalized and transformed into a 44-item questionnaire which was used to gather data from 167 participants. The questionnaire constituted the measures for the use of ICT in global planning and the data collected were used to test the measures for validity and reliability.

The measures or scales developed by this study can now be used in a follow-up study which is necessary on a much larger group of managers and this will provide evidence of the external validity of these measures. Future studies will also aim to validate the relationships proposed in the theoretical framework in Figure 1.

The study, as a whole, has implications not only for research but practice where it is becoming more and more inevitable to employ computer systems for global planning. Organisations often find it difficult to influence uncontrollable factors that may

impinge on their performance. It is therefore good news if there exist organisational factors (for instance global stance and structure which is included in this study) that managers can manipulate to enhance organisational performance and effectiveness in the use of information systems for global planning. Future search should clarify the significance of these factors and how they could be usefully influenced. Meanwhile, managers could note that the factors generated in this research could influence their use of information systems to plan the global activities of their organisations.

APPENDICES

Appendix I

Organisational factors to global planning with Information and Communication Technologies (IT)

This academic study seeks to establish the extent to which organisational factors affect the use of information systems for planning the global activities of organisations. Data will be used only in aggregates and only for academic purposes. You do *not* need to state your name and contact details except you are interested in being posted with the outcome of the study. Please complete this short questionnaire as accurate as you can and return to the address on the last page

(A) You

- A01 What is your position in the organization?
- A02 Are you involved in strategic planning? (please tick) Yes
No
- A03 Your name (*optional*)
- A04 Your address (*optional*)
.....
- A05 Your email (*optional*)

(B) Your organisation

B01 Type of business (please tick an appropriate option):

Financial services, accounting, business services	<input type="checkbox"/>
Law, property	<input type="checkbox"/>
Education, training	<input type="checkbox"/>
Healthcare, medical, pharmaceutical	<input type="checkbox"/>
Manufacturing, engineering, construction, oil, gas, mining	<input type="checkbox"/>
Telecommunications	<input type="checkbox"/>
Retail, wholesale, distribution, logistics, transport	<input type="checkbox"/>
Utilities: energy and water	<input type="checkbox"/>
Media, leisure, travel, entertainment, marketing, advertising, public relations	<input type="checkbox"/>
Information technology, computing	<input type="checkbox"/>
Other (please specify ...)	<input type="checkbox"/>

- B02 Approximate years in business (please tick an appropriate option): Less than 1
1 – 10
11 – 20
21 – 30
31 and above
- B03 Number of countries your organisation operates in
- B04 Approximately how many levels of management do you have?
- B05 Approximately how many employees are in your organisation?
- B06 Approximate turnover £..... B07 Approximate net worth £.....

<i>Scale:</i>	<i>Strongly agree</i>	<i>1</i>	<i>Slightly disagree</i>	<i>5</i>
	<i>Agree</i>	<i>2</i>	<i>Disagree</i>	<i>6</i>
	<i>Slightly agree</i>	<i>3</i>	<i>Strongly disagree</i>	<i>7</i>
	<i>Neutral (Neither agree or disagree)</i>	<i>4</i>		

Please indicate, by circling your chosen options, the degree to which you agree or disagree with these statements:

		Strongly agree					Strongly disagree	
B08	We standardise our products, services and practices irrespective of the country we operate in	1	2	3	4	5	6	7
B09	Our global standards are tailored to our original home country	1	2	3	4	5	6	7
B10	Our business operation is focused in a single trade region (eg EC) only	1	2	3	4	5	6	7
B11	In our business planning, we search for opportunities in more than one country	1	2	3	4	5	6	7
B12	In our planning, we try to take into consideration events (eg economic and social) that occur in more than one country	1	2	3	4	5	6	7
B13	Our information systems are closely aligned to our strategic goals	1	2	3	4	5	6	7
B14	There is a high level of delegation of authority and decision-making in the organisation	1	2	3	4	5	6	7
B15	We share power with our stakeholders (eg suppliers and customers)	1	2	3	4	5	6	7
B16	To provide a product or service to our customers, we rely on sharing information with our stakeholders (eg suppliers, customers)	1	2	3	4	5	6	7
B17	To provide a product or service to our customers, we rely on collaboration with our partner organisations	1	2	3	4	5	6	7
B18	We rely on information technology to collaborate with our partners	1	2	3	4	5	6	7
B19	We frequently change the structure of our organisation as a result of changes in customer demand and contributions of other organisations with whom we are collaborating	1	2	3	4	5	6	7
B20	Top management provides adequate training for using computers for global planning	1	2	3	4	5	6	7
B21	Top management provides adequate computing equipment for global planning	1	2	3	4	5	6	7
B22	Top management provides adequate financial and other support for using computers for global planning	1	2	3	4	5	6	7

(C) Availability of IT for global planning

Please tick which of these systems are available to you in your organisation for global decisions making and planning:

C01		Internet	<input type="checkbox"/>
C02	Groupware products such as Lotus Notes		<input type="checkbox"/>
C03	Enterprise planning systems such as SAP		<input type="checkbox"/>
C04	Video conferencing system		<input type="checkbox"/>
C05	Data warehousing/mining		<input type="checkbox"/>

C06 Other systems that you use in global planning (please specify)

(D) Extent of use by type of system

Please indicate, by circling your chosen options, the extent to which you use the following systems for global decision making and planning.

<u>Scale:</u>	<i>No Extent (None of the time)</i>	<i>1</i>	<i>A Good part of the time</i>	<i>5</i>
	<i>Rarely</i>	<i>2</i>	<i>Most of the time</i>	<i>6</i>
	<i>A Little of the time</i>	<i>3</i>	<i>Great Extent (All of the time)</i>	<i>7</i>
	<i>Sometime</i>	<i>4</i>		

		No						Great
		Extent						Extent
D01	Internet	1	2	3	4	5	6	7
D02	Groupware products such as Lotus Notes	1	2	3	4	5	6	7
D03	Enterprise planning systems such as SAP	1	2	3	4	5	6	7
D04	Video conferencing system	1	2	3	4	5	6	7
D05	Data warehousing/mining	1	2	3	4	5	6	7
D06	Others (please specify)							

(E) Extent of use by nature of use

Please indicate, by circling your chosen options, the extent to which you use information systems to achieve the following tasks.

		No						Great
		extent						extent
E01	Identification of internal strengths and weaknesses	1	2	3	4	5	6	7
E02	Performing environmental scanning to identify opportunities and threats	1	2	3	4	5	6	7
E03	Collaborating with your colleagues in the planning process	1	2	3	4	5	6	7
E04	Simplifying the planning process eg support for using your business model to perform statistical analysis for you or support for building scenarios and making "if-then" analysis.	1	2	3	4	5	6	7

Comments (can continue on additional paper, if necessary)

.....

Appendix II Factor Analysis
Rotated Component Matrix⁷

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
B08	-.062	.206	.914	-.027	-.020
B09	-.080	.111	.941	-.013	.081
B10	-.056	.211	.941	.051	-.027
B11	-.067	-.085	-.004	-.007	.928
B12	.186	.335	.049	.073	.472
B13	-.016	-.017	.024	-.009	.916
B14	.302	.431	.264	.183	.005
B15	.198	.604	.112	.378	-.024
B16	.011	.862	.133	.165	-.070
B17	.079	.862	.080	.071	.014
B18	-.166	.679	.150	.066	-.069
B19	-.244	.165	.244	.337	.205
B20	.240	-.025	.115	.734	-.068
B21	-.108	.265	-.168	.781	-.020
B22	.152	.080	.015	.840	.006
D01	.407	-.106	-.218	-.228	-.050
D02	.863	-.053	.097	.099	-.002
D03	.816	.063	-.085	-.029	.045
D04	.802	.137	.028	-.082	.003
D05	.790	.075	-.065	.096	.015
E01	.868	.009	-.057	.215	.011
E02	.850	-.085	-.014	.062	-.013
E03	.840	.186	.066	-.037	-.048
E04	.873	.078	.026	.179	-.008

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

⁷ Rotation converged in 5 iterations

REFERENCES

- Afifi, A. A., & Elashoff, R. M., (1966). Missing observations in multivariate statistics. Part I. review of the literature, *Journal of the American Statistical Association*, 61, 595-604.
- Alshawi, M and Goulding, J (2008) Organisational e-readiness: Embracing IT for sustainable competitive advantage, *Construction Innovation: Information, Process, Management*, Vol 8, Issue 1.
- Ang, C., Davies, M A., & Finlay, P. N., (2001). An empirical model of IT usage in the Malaysian public sector, *Journal of Strategic Information Systems*, 10, 159-174.
- Ash, J (1997). Organisational factors that influence IT diffusion in academic health science centers, *JAMIA* 4 (2), 102-111.
- Booth, S and Hamer, K (2007) Labour turnover in the retail industry: Predicting the role of individual, organisational and environmental factors, *International Journal of Retail and Distribution Management*, Vol 35, Issue 4, pp 289-307.
- Bowles, B. A., (1994). Collaborative working and integrated communications services in the UK manufacturing sector, *BT Technology Journal* 12 (3), 12-28.
- Buckley, P. J., (1998). A perspective on the emerging world economy: protectionism, regionalisation and competitiveness. in Mirza, H (ed) *Global Competitive Strategies in the New World Economy*, Cheltenham: Edward Elgar, 12-21.
- Campbell, D.T., & Stanley, J.C. (1966). *Experimental and Quasi-experimental Designs for Research*. Skokie, IL: Rand McNally.
- Carmines E., & Zeller R. (1979). *Reliability and validity Assessment*, London: SAGE Publications.
- Chae, M. S., and Hill, J. S., (1996). The hazards of strategic planning for global markets. *Long Range Planning*, 29 (6), 880-91.

- Chand, P., & Sethi, A., (1997). Organisational factors in the development of work stress. *Indian Journal of Industrial Relations*, 32 (4), 453
- Collins, J., (2001). *Level 5 Leadership: The Triumph of Humility and Fierce Resolve*. Harvard Business Review, January, 67-76.
- Cronbach, L. J., (1971) in Carmines E., & Zeller R., 1979, *Reliability and validity Assessment*, London: SAGE Publications.
- Daft, R L (2001). *Organisational Theory and Design*, Mason Ohio: South-Western
- DeVellis R. F., (1991). *Scale Development: Theory and Applications*, London: SAGE Publications.
- Doherty, N., & King, M., (2001). An investigation of the factors affecting the successful treatment of organisational issues in systems development projects. *European Journal of Information Systems*, 10 (3), 147-60.
- Doll, W. J., & Torkzadeh, G., (1998). Developing a multidimensional measure of system-use in an organisational context. *Information and Management*, 33, 171-185.
- Dong, L (2008) Exploring the impact of top management support of enterprise systems implementations outcomes: Two cases, *Business Process Management Journal*, Vol 14, Issue 2, pp 204-18.
- Ein-Dor, P., & Segev, E., (1978). Organizational context and the success of management information systems. *Management Science*, 24, 1067-77.
- Fletcher, K., & Donaghy, K., (1994). The role of competitor information systems. *Information Management & Computer Security*, 2 (3), 4 – 18.
- Fulmer, R. M., & Sashkin, M., (1995). Tools for the global learning organization. *American Journal of Management Development*, 1 (3), 26-31.

- Gable, K., (1986). Instrument development in the Affective Domain. Boston: Kluwer Nijhoff.
- Gay, L.R., (1987). Selection of measurement instruments. Educational Research: Competencies for Analysis and Application. (3rd ed.). New York: Macmillan.
- Goulielmos, M (2003). Outlining organisational failure in information systems development. Disaster Prevention and Management. Vol 12, Issue 4, pp 319-27.
- Grover, V., & Segars, A. H., (1996). The relationship between organisational characteristics and information system structure: an international survey. International Journal of Information Management, 16 (1), 9-25.
- Gray, F. C., Sauer, C., & Grant, C. N., (1997). Organisational impediments to successful technology transfer and diffusion. The Journal of the American Medical Informatics Association, 14, 112-24.
- Grubisic, D., & Goic, S., (2000). Some management and organizational attributes of small manufacturing enterprises in Croatia. Economic and Business Review for Central and South-Eastern Europe, 2 (1), 85-100.
- Haar, J M and Spell, C S (2008) Predicting total quality management adoption in New Zealand: The moderating effect of organisational size, Journal of Enterprise Information Management, Vol 21, Issue 2, pp 162-78.
- Hagel J., & Armstrong A.G., (1997). Net Gain, Boston: Harvard Business School Press.
- Hair, J. F., Anderson, I. E., Tatham, R. L., & Black W. C., (1998). Multivariate Data Analysis, New Jersey: Englewood Cliffs, Prentice Hall.
- Hinkin, T. R., (1995). A review of scale development practices in the study of organizations. Journal of Management, 21 (5), 967-989.
- Hill, C W L (1998) Global Business Today, NY: McGraw Hill.

- Ho, S. M., & Lee, T. M., (2001). Computer usage and its relationship with adolescent lifestyle in Hong Kong. *Journal of Adolescent Health*, 29, 258-66.
- Holt, D. H., (1998). *International Management: Text and Cases*, London: The Dryden Press.
- Huitt W. G., (1998). Internal and External validity. Retrieved from <http://www.valdosta.peachnet.edu/whuitt/psy702/intro/valdgn.html> 20 December 2006.
- Ives, B; Jarvenpaa, S. L; & Mason, R. O., (1993). Global business driver: aligning information technology to global business strategy. *IBM Systems Journal*, 32 (1), 143-61.
- Jackson, P., Wall T., Martin, R., & Dadids, K. (1993). New measures of job control, cognitive demand, and production responsibility. *Journal of Applied Psychology* 78, 753-762.
- Jae-On, K, & Mueller, C., (1978). *Introduction to Factor Analysis: What Is It and How To Do It*. CA: SAGE Publications.
- Jeannet, J., (1999). Strategies in the spider's web, *Mastering Global Business*, London: Pitman Publishing, pp.28-32.
- Jones, G. F., (2001). *Organisational Theory*. NJ: Prentice-Hall.
- Kay, J (1993). The structure of strategy. *Business Strategy Review*, 4 (2), 17-37.
- Kirk J., & Miller M., (1989) Reliability and validity in qualitative research. *Qualitative Research Methods*, Vol.1, London: SAGE Publications.
- Koustelios, A., (2001). Organisational factors as predictors of teachers burnout. *Psychological Reports* 88 (3), part 1, 627-34.

- Lacity, M., & Jansen, M. A., (1994). Understanding qualitative data: A framework of text analysis methods. *Journal of Management Information System*, 11, 137-160.
- Lawley, D. N., & Maxwell A. E., (1971) *Factor Analysis as a Statistical Method*. London: Butterworth & Co.
- Lissitz, R. W., & Green S. B., (1975). Effect of number of scale points on reliability: A Monte Carlo approach. *Journal of Applied Psychology*, 60, 10-13.
- Martinez, M T; Fouletier, P; Park, K H; & Favrel, J (2001). Virtual enterprise – organisation, evolution and control. *International Journal of Production Economics*, 74, 225-38.
- Mason, R. O., and Mitroff, I., (1975). A program of research on management information systems. *Management Science*, 21, 908-19.
- Melone, N. P., (1990). A theoretical assessment of the user-satisfaction construct in information systems research. *Management Science*, 36 (1), 76-91.
- Moller, C., (1997). The virtual organisation. *Automation in Construction*, 6, 39-43.
- Moor, G., & Benbasat I., (1991), Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information System Research*, 2 (3), 192 – 222.
- Morton, S. M., (ed) (1991). *The Corporation of the 1990s: Information Technology And Organizational Transformation* Oxford: Oxford University Press.
- Muratbekova-Touron, M (2008) From an ethnocentric to a geocentric approach to IHRM: The case of a French multinational company, *Cross Cultural Management: An International Journal*, Vol 15, Issue 4, pp 335-52.

- Özsomer, A., Calantone, R. J., & Bonetto, A. D., (1997). What makes firms more innovative? A look at organizational and environmental factors. *Journal of Business & Industrial Marketing*, 12 (6), 400-16.
- Peil, M., (1982). *Social Science Research Methods*. Suffolk: Bodder and Stoughton Ltd.
- Penrose, E. T., (1963). *The Theory and the Growth of the Firm*. Oxford: Blackwell.
- Pepper, K., Waterson, P., & Clegg, C. (2001). The role of human and organisational factors in the implementation of new IT systems to support aerospace design. Rolls Royce plc, No, 92830, pp ALL.
- Ramasubramanian, L., (1999). GIS implementation in developing countries: learning from organisational theory and reflective practice. *Transactions in GIS*, 3 (4), 359-80.
- Rasmussen, B., Borch, K., & Stark, K. D., (2001). Functional modelling as basis for studying individual and organisational factors - application to risk analysis of salmonella in pork. *Food Control*, 12 (ER3), 157-64.
- Rugman, A. M., & Hodgetts, R. M., (1995). *International Business and Strategic Management Approach*. NY: McGraw-Hill.
- Ryser, G. R., (1994). Developing reliable and valid authentic assessments for the classroom: Is it possible? *Journal of Secondary Gifted Education* Fall, 6 (1), 62-66.
- Sokol, R., (1992). Simplifying strategic planning. *Management Decision*, 30, (7).
- Sola, R., Garces, M. I., Vaquero, C., Sendino, F., DelaCal, C., & Villadoniga, J. I., (2000). Reviewing the impact of organisational factors on nuclear power plants safety: a Spanish research initiative. *Frontiers Science Series*, 34, 145-52.

- Schriesheim, C., & Hill K., (1981). Controlling acquiescence response bias by item reversal: The effect on questionnaire validity. *Educational and Psychological Measurement*, 41, 1101-1114.
- Schriesheim, C. A., Power, K. J., Scandura, T. A., Gardiner, C. C. & Lankau, M. J. (1993). Improving construct measurement in management research: comment and a quantitative approach for assessing the theoretical content adequacy of paper-and-pencil survey-type instruments. *Journal of Management*, 19, 385-417.
- Taylor, D. W., Yamamura, J H., & Nelson, M. (1999). Managing professionals: the impact of organizational factors on dimensions of satisfaction in chartered accounting firms. *Journal of Contemporary Issues in Business and Government*, 5 (1), 21.
- Tetteh, E., & Burn, J., (2001). Global strategies for SME-business: applying the SMALL framework. *Logistics Information Management*, 14 (1), 171 – 80.
- Thompson, B. & Daniel, L.G., (1996). Seminal readings on reliability and validity: A "hit parade" bibliography. *Educational and Psychological Measurement* 56, 741-745.
- Thompson, J. L., (2001). *Strategic Management*. UK: Thomson Learning.
- Torp, S., Riise, T., & Moen, B. E., (2001). The impact of social and organizational factors on workers' coping with musculoskeletal symptoms. *Physical Therapy*, 81 (7), 1328-38.
- Uoro A., (2002). *The Place of ICT in Global Planning*. *Advanced Topics in Global Information Management*. pp 136-49, London: Idea Group Publishing.
- Walters, D and Rainbird, M (2007) Cooperative innovation: a value chain approach, *Journal of Enterprise Information Management*, Vol 20, Issue 5, pp 595-607.
- Wiersma, W. (1991) *Research Method in Education* (5th ed.). Boston: Allyn & Bacon.

Wright, D. T., & Burns, N. D., (1998). New organisation structures for global business: an empirical study. *Int J Oper Prod Man* 18 (9-10), 896-910.

Yin, R. K., (1989). *Case Study Research: Design and Methods*. London: Sage Publications.

Zdunczyk, K and Blenkinsopp, J (2007) Do organisational factors support creativity and innovation in Polish firms? *European Journal of Innovation Management*, Vol 10, Issue 1, pp 25-40.