Journal of Design and Built Environment
Vol. 9, December 2011, pp. 75–88

A PERFORMANCE EVALUATION FOR IT/IS IMPLEMENTATION IN ORGANISATION: PRELIMINARY NEW IT/IS CAPABILITY EVALUATION (NICE) MODEL

Hafez Salleh[1], Nor Azlinda Mohamed Sabli[2], Azlan Shah Ali[1] and Mustafa Alshawi[3]
[1]Faculty of Built Environment, University of Malaya, Malaysia
[2]Faculty of Architecture, Planning & Surveying, University of Technology MARA, Malaysia
[3]Research Institute for the Built and Human Environment, University of Salford, UK
Corresponding Author: hafez@um.edu.my

Abstract

Most of the traditional IT/IS performance measures are based on productivity and process, which mainly focus on method of investment appraisal. There is a need to produce alternative holistic measurement models that enable soft and hard issues to be measured qualitatively. A New IT/IS Capability Evaluation (NICE) framework has been designed to measure the capability of organisations to*"successfully implement IT systems"* and it is applicable across industries.The idea is to provide managers with measurement tools to enable them to identify where improvements are required within their organisations and to indicate their readiness prior to IT investment. The NICE framework investigates four organisational key elements: *IT, Environment, Process and People*, and is composed of six progressive stages of maturity that a company can achieve its IT/IS capabilities. For each maturity stage, the NICE framework describes a set of critical success factors that must be in place for the company to achieve each stage.

Keywords: evaluation, information technology, information system, maturity model success

Introduction

The increasing of competition in the globalisation market nowadays, leave many companies with no option other than to make an investment in IT/IS for their business survival and future business expansion. This scenario has led to a significant amount of expenditure being invested in providing an appropriate IT/IS infrastructure, as well as to accommodate dramatic changes of business processes and strategies. According to UK Trade and Investment Report (2002) the UK software and computer services sector generated sales of US$39.7 billion in 2002, accounting for 8% of the global market and 3% of national GDP. This figure provides evidence of a significant amount of investment by companies in IT/IS. Another study by the Standish Group

(1999), incorporated data from several thousand IS/IT projects, revealed that only 26% of those projects finished on time and within estimated budget. Furthermore, 28% were terminated before they were finished, while the remaining 46% involved costs higher than the original estimates and were completed behind schedule. Such statistics, along with the high investment figures, have raised serious concerns regarding the successful implementation of IS/IT projects. All of this evidence signals, there is a need for pre-investment measurement approaches to help organisations plan carefully for their future investments in IT/IS. However, the traditional IT/IS measurementhas more emphasis on the technological and accounting /financial aspects (e.g. software engineering methods,discounted cash flow techniques etc) and neglects the organisational context and process of IT/IS development and its contents; elements that are critical to the successful application of IT/IS in support of the business (Serafeimidis& Smithson, 2003).

Current measurement models

An extensive literature review has been conducted to identify the current IT/IS evaluation models. This review exposed a wide range of methods, which have been divided into three different categories according to the focus of the evaluation. (Saleh and Alshawi, 2002);

i) *evaluating IS as a product;* DeLone & McLean (2004) developed a 'An Updated DeLone& McLean Success Model' focusing on measuring the organisational' performance of information systems. The model consists of six interrelated dimensions of information systems success; system quality, information quality, service quality, use, user satisfaction and net benefits. Whereas, Taylor (2003) developed 'e-Government Maturity Model' highlighting on performance measurement on the delivery of IT services to the public for the common infrastructure, maintenance, application development.

ii) *evaluating the processes which underpin the development of IS;* Serafeimidisand Smithson (2003) developed 'Four Orientation For IS Evaluation Model' focusing on four evaluation orientations; control, sense-making, learning and exploratory. This model investigates the organisational roles of the key stakeholders. While Grembergen and Saull (2001) proposed an 'Information Technology Balanced Scorecard Maturity Model (IT BSC'). This model adopted concept from the 'Balanced Scorecard Model' designed by Kaplan & Norton (1992). The IT BSC model concentrate on organisation's IT performance measurement system. Scheuing et.al (2000) developed the 'Maturity Model for IT Operations (MITO)' focusing on IT operations in the organisation. Paulk et. al (1993) designed the 'Capability Maturity Model (CMM)' for Assessing the process capabilities of software organisations on five different maturity model.

iii) evaluating the maturity of IT/IS within an organisation in terms of IS planning, infrastructure, utilisation, and management; Rudd, Hodgkiss and Cartlidge (2004) developed 'IT Infrastructure Library (ITIL) Framework' which focuses on key principles of IT service management; service deliver, service support, ICT infrastructure management, planning to implement service management, application management, the business perspective, security management. In addition the United States General Accounting Office (GAO) (2004) developed 'Information Technology Investment Management (ITIM) Framework'. This framework can be used to assess the maturity of an organisation's IT investment management and as a tool for organisational improvement. Furthermore,

Limitations of existing it/is evaluation approaches

There are significant limitations of existing IT/IS evaluation approaches, and these have been criticized by many authors, (Dusyhart *et. al*., 2003; Saleh & Alshawi, 2002; Serafeimidis & Smithson, 2003; Irani, 2002; Chan, 2000; Smithson & Hirschheim, 1998; Whyte & Bytheway, 1996; Zmud & Boynton, 1991; Lynch & Cross, 1991; Hirschheim & Smithson, 1988).

Saleh & Alshawi (2002) stated that the majority of the current IS measurement approaches are mainly post-investment measures which attempt to assist mangers in reviewing the results of their decisions on IS/IT investments and to assist them in future related investments. They do not address fully the above mentioned critical elements prior to the implementation of the IS projects. According to Duyshart et al (2003), the reason for the failure of traditional economic measurement techniques is that they do not take into account the so-called intangible or soft factors, such as accuracy, quality, convenience, variety, timeliness, flexibility, functionality, reliability, useability, user satisfaction, utilisation, relevance, security etc. This statement is support by Whyte and Bytheway (1996), saying that in the past, IT/IS success/failure focused on the more observable, tangible attributes and characteristics of systems products such as system response, times, data volumes and the extent of systems' usage. Duyshart et al (2003) also explain that even though there are extensive calculations that can be performed such as Return on Investment (ROI), Internal Rate of Return (IRR), Net Present Value (NPV) etc these techniques have often been demonstrated to be incapable of capturing the entire benefit of investment in ICT. While Serafeimidis & Smithson, (2003) suggest that most of existing IT/IS measurement model places excessive emphasis on the technological and accounting/financial aspects and neglect the organisational context and process of IT/IS development and its content. Hirschheim & Smithson, (1988) and Smithson & Hirschheim, (1998) also agreed that more attention has been focused over the years on prescribing how to carry out evaluations rather than analysing and understanding their role, interactions, effects and organisational

impact. Furthermore, views by Zmud and Boynton (1991) note that IS researchers have paid little attention to measurement development issues, and theoretical advancement have been constrained by the absence of reliable measures. To overcome these limitations, Lynch and Cross (1991), recommend that it was important performance measurement systems be dynamic in order to remain relevant and continue to reflect the issues of importance to the business. Overall, Bruns (1998) concluded that existing performance measurement often failed to reflect what organisations had to manage in order to make a profit.

The research approaches

The scenario of IT/IS failure in the organisation is further investigated by reviewing the literature regarding IT/IS implementation issues. The investigation is divided into two parts, the first part is reviewing the success/failure factors in IT/IS implementation, and the second part is dealing with the current measures to dealing with those scenarios. Various means were used to gather this information such as books, academic journal articles and research papers, conference proceedings, reports, magazines, etc. Apart of that, various local workshops and seminars has been attended to obtain directly an expert, practitioners and researchers' view on the experience, perception and attitudes towards IT/IS implementation issues. The literature review provides a basis for developing the research instruments through initial identification of the organisational factors of the successful IS/IT implementation, and current measurement models of IS/IT implementation in the organisation. During the literature review process, the author also identified The General Practitioner Information system (GPIS) model by Saleh & Alshawi (2005) that attempts to deal with the research problems that arise. The GPIS is a maturity model composed of six progressive stages of maturity, and embraces four key organisational elements: IT Infrastructure, People, Business Processes and Work Environments that an organisation can achieve in its information technology (IT) management capability. In the GPIS model, the description of each level of maturity has already been developed; however, there are no criteria in each level of maturity that have been provided as a guide in order to achieve a higher stage of maturity. The proposed framework isto expand and modify the GPIS model, mainly by adding those criteria and adjusting the description in each level of maturity that can be used as a practical guide for the managers prior to IT/IS implementation.The proposed NICE model is an attempt to further study of GPIS model that focuses on how a company can achieve success on their IT/IS investment by establishing the critical success factors (CSFs) for each of six maturity stages (refer Table 2).The NICE model will further enhance, test and validate through pilot study, case studies and large questionnaire survey within constructions' communities.

The New IT/IS Capability Evaluation (nice) model

The New IT/IS Capability Evaluation (NICE) model is based on an extended model of General Practitioner IS Measurement Model (GPIS) proposed by Saleh & Alshawi (2002). The NICE model adopted the attributes of four key organisational elements of the GPIS model; *IT, People, Process and Work Environment*. The proposed NICE model is an attempt to further study focus on how a company can achieve success on their IT/IS investment by establishing the critical success factors, and as an indicator, the state of the organisation's readiness prior to IT/IS investment. Table 1 summarise the attributes of each of the four key organisational elements.

The NICE framework is a maturity model composed of six progressive stages of maturity that an organisation can achieve in their investment and implementation of IT/IS. These maturity stages are cumulative; which means, in order to get a higher position in the maturity stages, the organistion must comply with the pre-ordained requirements for that stage (in addition to those for all the lower stages).

Table 1: The attributes of the key elements of the NICE model

Key Elements	Attributes	Comments
IT Infrastructure	Business Implementation	Describes the business system in its environment of organisation comprises of business objectives, business strategy, business-IT development, business planning
	Application	The system and software application components and their relation with business implementation
	Communication Platform	Detail the computers and networks connection that will be used as a communication platform for the construction of the system for the enterprise
People	Involvement	The involvement of staff in the IT/IS development in the organisation and the relationship between user and developer
	Staff	Staff of the organisation who are involved in the implementation, maintenance and use of the proposed IS
	Skills	Skills available/required to effectively implement the IS in the organisation
Process	Business Processes	Represented by the process "Practices" within the organisation
Work Environment	Culture	The cultural style of the organisation
	Leadership	Characterisation of managers'behaviour in achieving the organisation goals
	Structure	Characterisation of organisations' structural chart (i.e. functional, centralised/decentralised, etc.)

The NICE frameworks offers four key IT/IS capabilities for anorganisation: (1) as a tool for internal evaluation of the organisation's capability of IT/IS development (2) as measurement of the organisation's capability in managing the development of IT/IS (3) as anindicator the state of the organisation's readiness prior to IT/IS investment (4) a road map that organisation can use for improving their IT/IS development. For each of maturity stages, the NICE framework describes a set of critical success factors that must be in place for the organisation to achieve that stage.

IT Infrastructure element

Level 1: Small IT/IS are developed or purchased mainly small and off-the-shelf financial packages, where the decision regarding their acquisition tend to be ad-hoc in nature, made at low levels within organisation mainly at group level and are based on what the management sees taking place within other external organisation. Mostly all system tend to be independent of each others (stand-alone) and built/purchased in isolation from other IT/IS located in the organisation or even in the same group.The workstation exist on a standalone basis with no share IT/IS services.

Level 2: An increase number of ad-hoc IT/IS being develop or purchase for small number of core business. The IT/IS application is more on operational system within the financial area while a small number of other core business-oriented systems are being developed. Many of the IT/IS application systems still overlap in purpose, function and data. A high maintenance load is being placed on IT/IS function. Some hardware, system software, and network communication are shared between groups. All data is stored in unit systems.

Level 3: Short term planned IT/IS development start to appear with management welcome user involvement over the user's needs and requirements. In-house IT/IS applications cover most major operation areas but the IT/IS services vary between the business units. Office automation exists but in isolated, standalone manner. The organisation still has some IT/IS application systems put together by users. Some new systems are developed, installed, and operated by the central IT/IS function. Centralised communication networking IT/IS services start to appear to control IT/IS operation within organisation.

Level 4: The management start to consider long term development of IT/IS with an attempt to align business strategy and IT strategy. All required operational IT/IS is mostly in place and some decision support system (DSS) start to appear. Standard e-mail messages throughout the organisation are extensively used, which indicates the beginning of dependency on the organisation-wide network in conducting formal communication. Office automation is integrated and standardise organisation-wide communication and organisation-wide network is in place, where all groups are connected.

Level 5: The management consider the strategic advantages development of IT/IS used to add value organisational

products or services and to support supply chain activities. Strategic IT/IS applications are developed with external-oriented data through the use of electronic data interchange (EDI) with external entities such as customers, government and suppliers along with development of DSS and executive information systems (EIS) for the use of senior management. The organisation start to develop strategic IT/IS communication infrastructure to interact with external entities.

Level 6: The development of IT/IS is move forward to support strategic business objectives. Organisation use inter-organisational systems with outside entities (government, suppliers, etc) with sharing IT/IS services such as the internet, e-commerce technology etc. Organisation have diverse hardware architecture according to each unit's needs and successfully develops and use group support systems (GSS) and knowledge management systems (KMS). Inter-firms network and standard infrastructure is use such as data format like eXtensibleMarkup Language (XML), EDI, Broadband, Wireless, etc

People Element

Level 1: No skills in IT/IS required for new recruitment. Users find it very hard to acquire IT/IS skill based on existing systems. No IT/IS training provided. User skill is improved by individual effort. The work is require little IT/IS skills. No individual responsible for the IT/IS function. No IT/IS manager. No dedicated IT staff, small number of low-level technicians and programmers. External contactors may be used to develop/install small systems. IT/IS function has little control over users IT/IS related activities and little user participation in IT/IS decision.

Level 2: The new user recruits areexpected to have basic IT/IS skills. Programme training and skills for the users exists. Small numbers in-house technical expertise in IT/IS development (methodology, structured techniques) and other important skills. The staff are working towards acquiring and understanding skills needed to develop and maintain complete system such as programming, analysis and programming skills, and are being able to install off-the-shelf, ready made packages. The IT/IS manager is responsible for the IS/IT function. Small numbers of IT/IS staff comprises of systems analysts recruited. The IT/IS staff responsible for adequately understanding the user requirements for systems development. The relationship may exist between users and IT/IS staff and begin to looking at users' knowledge and skills.

Level 3: A new user recruit are expected to have specific IT/IS related skills. Considerable IT/IS skills are expected within organisation, including on-going enhancement and improvement of IT/IS capabilities. Well developed project management skills are acknowledged, and the IT/IS manager and staff seek to build interpersonal skills. A technically oriented IT/IS manager is appointed. Dedicated IT/IS planners and database administrators are appointed. Adequate technical and specialists staff to coordinate between current and future IT/IS needs. The IT/IS function seeks

to control and welcome users involvement over the users needs and requirements concerning IT/IS matters.

Level 4: IT/IS staff are required to have business skills. A user gains a proper insight into IT/IS related issues. A high level manager for the IT/IS services area is appointed with middle management status. In addition to programmers, systems analysts and data base administrators, the organisation also has business analysts. The users have a significant degree of involvement in IT/IS-related decisions. IT/IS investments are derived from users' stated needs. The IT/IS function supports users activities.

Level 5: The business/IT/IS staff gains cross-disciplinary experience. Core technical skills are developed. Very knowledgeable IT/IS users are in place. The IT/IS manager has senior management status. The organisation seeks to develop and retain core hybrid staff and in certain development, expertise is outsourced. Partnership exists between IT/IS function and user groups in a large organisation. IT/IS function and users cooperate on equal basis as partners, and a continuous strive exists for the integration of organisational workgroups.

Level 6: The workgroups are optimising their IT/IS capability and competency for performing their work processes. The IT/IS manager becomes a full member of the directorate, and plays an active part in determining strategic direction. The IT/IS staff keep up with the strategic needs of the group. Central coordination of the strategic coalition between the IT/IS function and user groupsis continually improved.

Environment Element

Level 1: There is little concern for the potential utility of IT/IS. Little or no control of IT/IS function and or no formal IT/IS organisational structure. The lack of consistency in management of IT/IS activities. Staff perform business and IT/IS activities individually.

Level 2: IT/IS concerns technologies not management. IT/IS function is decentralised. The manager controls IT/IS activities with necessary measures. Staff perform tasks with certain rules and procedures.

Level 3: IT/IS is one of the many ways to reduce costs in the firm and sees expenditure on IT/IS as a cost saving expenditure. IT/IS function becomes centralised and IT/IS staffseek control of IT/IS matters. The manager facilitates the needs and requirements of staff towards business and IT/IS development. Staff begin to become aware what they want

Level 4: IT/IS is vital for smooth functioning of operations. IT/IS function is well established and IT/IS services are beginning to decentralized, with central standards and policy for co-ordination, implementation and utility. The manager sometimes needs staff feedback and opinions on business and IT/IS matters. Staff's business and IT/IS skill and ability are improved.

Level 5: IT/IS is one of the vital parts of the competitive advantage. Central IT/IS function provide an organisation-wide communication system, major data processing and large scale hardware within large organisation. The staff are

invited to participate in the planning and implementation of business and IT/IS activities. Staff begin to gain confidence on their capability

Level 6: IT/IS is the most single critical factor to success in business. Central IT/IS function provide organisation-wide communication, sharing service centre, major data processing and large scale hardware to interact to external environment. A federal decentralised IT/IS function unit also still exists. The manager has full trust and confidence of employees' skills and abilities Staff reach consistency in skills, ability and understanding towards business and IT/IS planning and implementation.

Process Element

Level 1: No standard business processes exists and no alternative plans during crisis prevail and often leading to compromise on quality. Heavily dependent on individual skills to perform the business tasks.

Level 2: Policies and standard procedures are established for major business activities.

Level 3: Most of business activities are documented and standardised within workgroups.

Level 4: The well-defined business process activities, including standard business descriptions and models for performing the work task within the organisation are evident.

Level 5: Well established and maintained quantitative objectives for process exists, eg. about quality and measuring the product/services, the degree of customer satisfaction, and the level of harmony across the supply chain.

Level 6: Ensuring continuous improvement of the process in fulfilling the relevant strategic business goals.

Conclusion

The NICE framework is an attempt to establish a critical success factors within four main elements in the organisation and provides a quick reference for the manager to improve their IT/IS management toward the highest maturity stage. The framework is a further work from the GPIS model and was blended process from an extensive literature reviews and expert opinion and will further enhance through pilot study, case studies and large survey. Practically, there is not compulsory for all key elements or even sub-elements of the NICE framework to be at the same level of maturity to be considered as successful IT/IS implementation. This is due the factors that the required state of readiness may be different for each element and sub-elements for any given IT/IS and the nature and requirements could vary from one organisation to another. This requires a serious attention from an IT/IS experts in that particular industry who has better knowledge and understandings for detailed investigation to identify the precise and specific requirements needed.

Table 2: The Critical Success Factors (CSFs) for NICE Framework

	IT		
	Business Implementation	**Application**	**Communication Platform**
Level 6	**STRATEGIC OBJECTIVES** • The products and services is value driven • Business expand world-wide (globalisation) • The development of IT/ IS through research and development (R & D) activities • Strategic alliances • Project Collaboration	**INTER-ORGANISATIONAL SYSTEMS** • Project extranet collaboration system • Group support system (GSS) • E-Commerce system • Knowledge management system (KMS)	**INTER-ORGANISATIONAL COMMUNICATION** • Dedicated network • Close group networks Virtual Private Network (VPN) • Wide area network (WAN) • Wireless
Level 5	**ADDED VALUE** • The product and services is market-driven (customer requirements) • Business expand with partnership with partner, supplier, customer, competitors • The development of IT/ IS focus to added value to products and services	**VALUE CHAIN INTEROPERABILITY SYSTEM** • Executive information system (EIS) • Electronic data interchange (EDI) • E-tendering • Integrated supply chain management (SCM) system • Customer relationship management (CRM) system • Enterprise resource planning (ERP)	**INTRA-ORGANISATIONAL COMMUNICATION** • Value added networks (VAN) for EDI system • n-tier architecture
Level 4	**LONG TERM BUSINESS PLANNED** • The products and services is business-driven • Business expand to the continent area • The IT/IS development carried out by staff align with business strategy • Strong company's mission and vision • Comprehensive IT/IS/business plan • Business practical manual	**INTERNAL SUPPLY CHAIN SYSTEM** • Groupware • Internal supply chain system • Decision support system (DSS) • Enterprise portal • Network software	**ORGANISATIONAL COMMUNICATION** • Local area network • Intranet
Level 3	**SHORT TERM BUSINESS PLANNED** • The products and services is profit-driven • Business expand nation-wide • The IT/IS development carried out by considerable IT/IS skill staff and less involvement with vendor • Short term IT/IS plan	**WORK GROUP SYSTEM** • Electronic Data Management System (EDMS) • Bespoke application • Different IT/IS services between business unit • Standalone office automation	**WORK GROUP COMMUNICATION** • Workgroup network within organisation– establish client-server network
Level 2	**MULTIPLE CORE BUSINESSES** • Diversify products and services • Business expand to the regional area • The IT/IS development carried out by technical personnel with vendor • IT/IS development based on project's requirements	**SELF-CONTAINED SYSTEM** • The financial application develop by staff and vendor • Transaction processing system (TPS) • Many IT/IS application systems still overlap in purpose, function and data	**SELF-CONTAINED COMMUNICATION** • Workstation network within business units - client / server architecture • All data stored in unit system
Level 1	**AD-HOC – SINGLE CORE BUSINESS** • Products and services limited to the core-business • Local area of business • Heavily depends on the vendor for IT/IS development • IT/IS user determine their own needs • IT/IS development focus on business unit	**STAND-ALONE SYSTEM** • Small and off-the-shelf financial application • Office application i.e. words, spreadsheets, presentation, database etc	**STAND-ALONE COMMUNICATION** • No networks • Standalone workstation

Table 2 (continue)

People		
Skill	**Staff**	**Involvement**
SKILLS ENHANCEMENT • Individuals and workgroups are empowered to continuously improve their capability for improvement • Individuals characterize and evaluate the capability and performance of their personal work processes • Workgroups evaluate the capability and performance of their operating processes	**STRUCTURED STAFF** • IT/IS manager at the high position in the organisation structure (board of director) • IT head leading the workgroups to set the application and system • In some matured organisation, exist the position of Chief of Information Officer (CIO)	**STRATEGIC** • User involved in tasks analysis, prototyping, usability testing & evaluation *(user-centred design)* • Developer reach consensus decision on IT/IS with the user *(consensus)*
SKILLS INTEGRATION • Business activities involving dependencies between workgroups • Organisational structure support multi-disciplinary work	**HYBRID STAFF** • IT/IS manager at the senior management status • Staff gain cross-disciplinary experience and knowledge in the business and IT/IS (hybrid staff) • In some development, expertise is outsourcing	**PARTNERSHIP** • User involved in workshops and usability testing of system or application prototype *(participatory design)* • User and developer compromise each other on their needs and requirements in decision making *(equality)*
SKILLS DEPLOYMENT • A strategy for developing and deploying the data and information is created in standard format and made available for use • The organisation's stated values encourage knowledge sharing between individuals and workgroups	**BUSINESS-ORIENTED STAFF** • IT/IS manager at the middle management status to control the IT/IS infrastructure • The appointment of business analysts in the organisation structure to run BPR exercise	**CONSULTATIVE** • User involved in analyse user activities, behaviour, social and culture analysis *(ethnography)* • Developer seek the user 's opinion in decision making (*consultative*)
SKILLS ACQUISITION • Recruiting activities are planned and executed to satisfy the organisation's requirements for workforce competencies • Selection processes for new recruit enhanced • Recognition and rewards developing workforce skills at individual and workgroups levels	**TECHNICAL-ORIENTED STAFF** • Highly technical IT/IS manager exists in the organisation structure • IT/IS planners and database administrator to take in charge of IT/IS infrastructure and application	**REPRESENTATIVE** • User involved in tasks and work process analysis *(contextual design)* • IT/IS decision making is being made in attendance of user's representative *(representative)*
SKILLS DEVELOPMENT • List of critical skills • Skills evaluation	**EXPANSION OF STAFF** • Small numbers in-house technical expertise in IT/IS development (methodology, structured techniques) and other important skills • The IT/IS manager is responsible for the IT/IS function in the workgroups • System Analyst position exist in the organisation structure	**AD-HOC INVOLVEMENT** • User involved in providing basic needs and requirements • User developer relationship is ad-hocbasis
BASIC SKILLS Ad-hoc and unstructured, and unpredictable skill identification	**UNSTRUCTURED STAFF** • No IT/IS personnel exists in the organisation structure • Low level technician and programmers take in charge of IT/IS development in the organisation • Small systems develop and install by external expertise	**BASIC INVOLVEMENT** • The user is involved in determine their needs and requirements to the IT/IS developer • little user-developer relationship exists at this stage

Table 2 (continue)

	Environment		
	Culture	**Structure**	**Leadership**
Level 6	**KNOWLEDGE - BASED** • Knowledge managements regarded as : central to product and process innovation and improvements • 'Informational culture' - design the system according the explicit and implicit knowledge that individual possess • IT values is measured quantitatively and qualitatively	**HYBRID MODEL/FEDERAL STRUCTURE – (TO ENABLE OPERATION OF INTER-ORGANISATIONAL SYSTEM)** • Centralised IT/IS infrastructure organisation-wide • Decentralised IT/IS application and system decision making to the workgroups	**TRANSFORMATIONAL LEADERSHIP (Idealized Influence)** • Delegative • Accessibility • value base, good example, responsibility • Consistency action • Staying responsible upon resistance • Mutual trust
Level 5	**MARKET - BASED** • Customer-driven • Partnership with partners, suppliers, customers, competitors • Promote creative and innovative environment • Flexible working systems • IT/IS investment influenced by market factors	**HYBRID MODEL/FEDERAL STRUCTURE – (TO ENABLE DIRECT COMMUNICATION WITH CUSTOMER/CLIENT)** • Centralised IT/IS infrastructure organisation-wide • Decentralised IT/IS application and system decision making to the workgroups • Closer to business grass roots	**TRANSFORMATIONAL LEADERSHIP (Intellectual Stimulation)** • Participative • promote participation and creativity • Involvement of staff for long term planning • Participative style is significantly practiced between senior manager and first-level manager
Level 4	**OPERATIONAL - BASED** • The focus is on ensuring that the transaction systems are in place • Process oriented • Individual possess knowledge and skills limited to certain work tasks • Sharing processes for particular tasks within organisation	**THE EARLY STAGE OF HYBRID MODEL/FEDERAL STRUCTURE** • BPR exercise to standardize various business processes • centralised IT/IS infrastructure organisation-wide • Decentralised IT/IS application & system decision making to the workgroups	**TRANSFORMATIONAL LEADERSHIP (Individualized Consideration)** • Consultative • support and confront • Proactive • Future aims • Developmental needs
Level 3	**COST - BASED** • IT values is measured quantitatively (financial cost/profit ratio) • Profit driven - every project based on their feasibility to gain profit • Tight budget control - centralized (top management) monitoring on expenditure	**CENTRALISED** • Centralised IT/IS infrastructure • Centralised IT/IS application & system • Economical factor - tight budget; the potential cost savings from centralization with single data centre and single cost centre control IT/IS activities within organisation	**TRANSACTIONAL LEADERSHIP (Contingent reward)** • Demand and reward • Seek agreement • Personal attention staff based on needs and requirements for growth and develop • Delegate tasks and then monitor
Level 2	**TECHNOLOGY - BASED** • An 'IT-led' syndrome (IT professionals' hold on technical supply) • Separating technologies from company's business planning • 'Informatic culture' - design the system from technical point of view, then persuade staff to adapt to it	**DECENTRALISED** • Decentralised IT/IS infrastructure • Decentralised IT/IS application & system • Diversity of shareholders	**TRANSACTIONAL LEADERSHIP (Control and corrective action)** • Directive • control and corrective action • rules to be followed • Routine situation • Responsive • Dealing with present issues
Level 1	**TASK - BASED** • IT/IS utilisation based on ad-hoc basis • Users determined their needs and requirements • Non data sharing culture exist • Each users with different task • Each individual has own separate processes • Independent and sequential process • Documents held by individual	**NO FORMAL IT/IS FUNCTION** • Vendor influenced on IT/IS infrastructure and applications • Selection on IT/IS infrastructure and applications & system based on ad-hoc basis and individual tasks	**LAISSEZ-FAIRE - NON-LEADERSHIP** • Carrying out the tasks without caring about others • Avoiding responsibility • little control over his group activities • Staff to sort out their roles and tackle their work

Table 2 (continue)

	Process
	Process
Level 6	**INSTITUTIONALISE AN OPTIMISING PROCESS** • Ensure Continuous Process Improvement • Correct Common Cause of Problems
Level 5	**INSTITUTIONALISE QUANTITATIVELY MANAGED PROCESS** • Establish Quality Objectives • Stabilize Sub-process Performance
Level 4	**INSTITUTIONALISE DEFINED PROCESS** • Establish a Defined Process • Collect Improvement Information
Level 3	**INSTITUTIONALISE MANAGED PROCESS** • Establish an Organisational Policy • Plan the Process • Provide Resources • Assign Responsibility • Train People • Manage Configurations • Identify and Involve Relevant Stakeholders
Level 2	**ACHIVE SPECIFIC GOALS**. • Identify Work Scope • Perform Base Practices
Level 1	**AD-HOC LEVEL** • Practices are performed in an ad hoc way

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