A Framework for the Assessment of ICT Maturity in Becoming a WCU

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ABSTRACT

ICT has become a very important element in determining the standard and quality of efficiency of many organizations. The dynamic of ICT is so rapid that sometimes, we tend to overlook the necessity of measuring and assessing its development and sophistication in meeting the organizational needs and objectives set forth. The framework discussed in this paper can be considered as a guide to assess the maturity of UiTM's ICT facilities in becoming a world class university.

Keywords: *ICT, assessment framework, WCU*

Introduction

Of late, ICT infrastructure is seen as the backbone of any organizational planning and objectives. ICT application's attempt has to be properly drawn up and laid out as it will help determine its maturity level once implemented as an indicator of the organization's success in adopting ICT.

Adequate facilities for academic work are essential – the most advanced and creative research and the most innovative teaching rely on access to appropriate libraries and laboratories, as well as to the internet and other electronic resources (Altbach 2004). Universities' objectives should support research infrastructure, i.e. facilities related to education and research – electronic libraries, laboratories etc. (Kim 2001).

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An effective institution's wide application of ICT starts with proper planning. A major indicator for ICT maturity is the way in which the ICT planning and monitoring function has been formalized. In this respect it should be stressed that important outcomes of the information policy planning process are the resulting plan and the planning process itself: the latter aids in creating awareness and consensus which are absolutely necessary for the effective implementation of the Information Policy Plan (IPP). The IPP should be directly linked to the institution's strategic priorities. As such, an IPP can either be part of the University's Strategic Plan, or be derived from it in the form of a separate plan. In those cases where the IPP only contains ICT priorities and high-level guidelines, their implementation may be further specified in an Information Master Plan and Information Services Project plans (AAU 2000).

Becoming a WCU in 2006, UiTM does not bear any exception in meeting the requirements of providing high-level maturity standard of the ICT infrastructure. Every organization has its own methods of assessing its ICT maturity level. In the context of UiTM as a university, perhaps this model, which is based on the Association of African Universities (2000) ICT assessment tools, can be used in determining its ICT maturity. The relevant variables which can be used when assessing plans in universities are:

i. Availability of University Strategic Plan;
ii. Availability of derived Information Policy Plan;
iii. Availability of derived Information Master Plan; and
iv. Availability of derived Information Services Project plans

The list is meant to assess the important aspects in each of these plans in determining how explicit they are and whether they are properly planned in meeting the university's objectives and requirements.

Importance of ICT Assessment

Tackling mobility and quality assurance are the priorities in building a WCU (Van der Pas 2004). With the impact of information technology in our everyday life, ICT has become very important in determining the standard and the quality of the facilities provided. However, the dynamic of ICT is so rapid that sometimes, we tend to overlook the necessity of measuring and assessing its development and sophistication in meeting our organizational needs and objectives set forth.

By assessing the maturity standards of the ICT system that is implemented, it will therefore, meet the following objectives:

i. To set benchmarks and goals for ICT
ii. This can be used as a tool to identify the universities current ICT profile and set goals for the future as part of their strategic planning; it can be used to determine where funds are needed;
iii. To apply for grants and fundraise
iv. This assessment can be used as a tool to identify their ICT maturity level, i.e. in relation to profiles and objectives when applying for technology related grants;
v. To create assessment tools
vi. The assessment of ICT maturity tool can also be a basis for constructing an institutional technology assessments.

Determining ICT Maturity

The AAU's Assessment of ICT Maturity Tool (2000) (refer to Tables 1 – 7) is meant to be as a guide, not a definite measure of an effectiveness in planning for ICT resources and in integrating ICT in teaching, learning and research; academic information services; and administration and management. Depending on the variables of the institution, it may fall within a wide range of ICT development. Such mixed results are to be expected since this tool is intended to be a guide.

This tool suggests looking at five sets of variables and five (5) stages of ICT development as suggested below.

i. The assessment could be done within each faculty or school or department especially if there is a wide range of variation and then aggregated to show a profile of the whole institution.For each column in the matrix, (see pages 5 – 10), find the box that most accurately describes the faculty or school or department being assessed.
ii. After determining where the faculty or school or department falls, compare the variables with the ones listed in the column of the assessment table (refer Tables 1 – 7), which should be equal to an deal scenario.
iii. Read the corresponding explanation for the five sets of variables and the five stages of technology development (refer Tables 1 – 7).
iv. Use the findings to start discussions with the leadership or management of the institution.

Write up the findings and next steps, including benchmarks and goals for ICT integration, so that they can have a basis or foundation against which to assess in achieving the ICT goals and objectives (AAU 2000).

Method of Assessing ICT Maturity (in Universities)

The assessment tool introduced has been used by the Association of African Universities in assessing the ICT maturity level of universities throughout Africa. This assessment tool consists of several stages that are:

i. Entry stage
ii. Adoption stage
iii. Adaptation stage
iv. Appropriation stage
v. Invention stage

These stages will determine the extent of maturity of the ICT being used at certain organizations or universities.

Suggested Matrix for Assessing Planning and Monitoring Tools Using the Characteristics of Each Stage

Table 1: Matrix for Assessing Planning and Monitoring Tools
(Adapted from Association of African University (AAU) 2000)

Planning and monitoring tools	Entry Stage	Adoption Stage	Adaptation Stage	Appropriation Stage	Invention Stage
University strategic plan	Minimal, limited goals, not explicit, not shared/ known by various stakeholders	Some clear goals. ICT may be mentioned as a means to improve efficiency of administrative and management support processes	Continuous improvement. ICT mentioned as a means to improve overall information provision	Vision for meeting expanding goals. ICT is identified as one of the institution's strategic resources	Strategic planning. ICT is identified as a resource to gain market share and/or change the institution.
Information Policy Plan	Minimal, limited goals. Emphasis on hardware (computers) instead of the institution's application, no link to institutional priorities	Some clear goals. Emphasis on improving efficiency of administrative procedures through administrative systems	Continuous improvement. Emphasis on communication, sharing of information, integration, networks; building up of ICT support structure; separate ICT budget	Vision for meeting expanding goals is built around information & communication SERVICES, related to CORE BUSINESS, as a catalyst for reform	Information policy planning around information and communication Services for dynamic growth of the institution: document often integrated with University Strategic Plan

Table 2: Continuation Matrix for Assessing Planning and Monitoring Tools (Adapted from Association of African University (AAU 2000)

Planning and monitoring tools	**Entry Stage**	**Adoption Stage**	**Adaptation Stage**	**Appropriation Stage**	**Invention Stage**
Information Master Plan	Minimal, limited goals; basically a hardware acquisition and installation plan defined and executed by technicians	Some clear goals; basically a system selection and installation plan defined and executed by technicians together with some users	Continuous improvement; attention for (network) infrastructure, systems, ICT support structure, ICT budget defined mainly by users, executed by both technicians and users	Vision for meeting expanding goals is built around information and communication services to improve teaching & learning and research; to increase decentralization and accountability as a catalyst for reform; top-management is ICT change agent	Information planning around ICT for dynamic growth of the institution; ICT master plans often at decentralized level, within boundaries of institutional ICT guidelines
Information Project	Minimal, limited goals; not available	Some clear goals; separate software installation plans	Continuous improvement; projects aiming to improve various services through the use of ICT as a tool (tech. not an aim in itself anymore)	Vision for meeting expanding goals is built around technology as a catalyst for reform: ICT as part of process redesign.	Information planning around technology for dynamic growth of the inst.; ICT applied in new and innovative ways; ICT innovation projects instead of development projects.

Table 3: Continuation of Matrix for Assessing Planning and Monitoring Tools (Adapted from Association of African Universities (AAU) 2000)

Planning and monitoring tools	**Entry Stage**	**Adoption Stage**	**Adaptation Stage**	**Appropriation Stage**	**Invention Stage**
Information Project	Minimal, limited goals; not available	Some clear goals; separate software installation plans	Continuous improvement; projects aiming to improve various services through the use of ICT as a tool (tech. not an aim in itself anymore)	Vision for meeting expanding goals is built around technology as a catalyst for reform: ICT as part of process redesign.	Information planning around technology for dynamic growth of the inst.; ICT applied in new and innovative ways; ICT innovation projects instead of development projects.

Suggested Matrix for Assessing Application of ICT in Research Using the Characteristics of Each Stage

Table 4: Matrix for Assessing Application of ICT in Research (Adapted from the Association of African Universities (AAU) 2000)

ICT in Research	Entry Stage	Adoption Stage	Adaptation Stage	Appropriation Stage	Invention Stage
Objective of the application of ICT by academic staff and students	To aid "non-interactive" research (e.g. statistical packages, simulation software, etc.)	To collect academic info. (e.g. www, discussion groups, on-line catalogues, etc.)	To disseminate academic info. generated by academic staff and students (e.g. www, electronic publishing houses, etc.)	To collaborate with other researchers worldwide To 'advertise' research plans/ efforts	To create research networks

Suggested Matrix for Application of ICT in Academic Information Services (Library)

Table 5: Matrix for Application of ICT in Academic Information Services (library) (Adapted from the Association of African Universities (AAU) 2000)

Application Academic Information Services (library)	Entry Stage	Adoption Stage	Adaptation Stage	Appropriation Stage	Invention Stage
Provision of on-line public access catalogue (OPAC)	Available in the library Access for library staff only	Available in the library, on campus (through campus network) Access for library Staff, academic staff	Available in the library, on campus, and on the Internet. Access for library staff, academic staff and students		
Provision of training in academic information management	Library staff only	Library staff and Academic staff	Library staff Academic staff Some Students	Library staff Academic staff All Students	Library staff Academic staff Students Public

Suggested Matrix for Assessing ICT Infrastructure Using the Characteristics of Each Stage

Table 6: Matrix for Assessing ICT Infrastructure (Adapted from the Association of African Universities (AAU) 2000)

ICT infrastructure	Entry Stage	Adoption Stage	Adaptation Stage	Appropriation Stage	Invention Stage
Type of infrastructure	Stand alone computers	(Various) Local Area Networks	Campus-wide backbone connecting LAN's	Multi-campus backbone connecting LAN's	
Type of carrier technology:	Reliance on PSTN lines alone	Wireless radio UTP Coaxial	VSAT	Fibre optical cables	Wireless, Combination of various technologies including emerging technologies
Type of functionality being provided	e-mail only	e-mail plus internet/ www access	e-mail internet/ www access plus conferencing/ group work tools	e-mail internet/www access conferencing/ group work tools plus video	e-mail internet/ www access conferencing/ group work tools video
Accessibility	computer-student ratio (low or specify numbers) computer-staff ratio	computer-student ratio computer-staff ratio	computer-student ratio (medium) computer-staff ratio	computer-student ratio computer-staff ratio	computer-student ratio (high or specify optimal student ratio) computer-staff ratio
Actual use (as compared to accessibility): -Staff use average hours per week -Student use average hours per week	low for staff almost unavailable to students	low for staff low for student	medium for staff low for students	Medium for staff medium for students	high for staff high for students
Operating system	Windows OS	windows NT for networks	linux OS including its use for networking	web design languages, e.g. html, JavaScript, Java & other object oriented lang.	

Suggested Matrix for Assessing ICT Organizational (Support) Infrastructure

Table 7: Matrix for Assessing ICT Organizational (Support) Infrastructrure (Adapted from the Association of African Universities (AAU) 2000)

ICT organization-nal (support) infrastructure.	**Entry Stage**	**Adoption Stage**	**Adaptation Stage**	**Appropriation Stage**	**Invention Stage**
Committees available with some or all of the following mandates (read across):	None	Carry responsibility for management and maintenance of the shared ICT infrastructure	Support administrative units in use of administrative systems Consider ICT users' needs	Support academics in the development and application of ICT-based teaching and learning materials Support academics in the use of ICT tools in research	Support students in the use of ICT tools in learning and research
Support responsibilities:	Individual 'ICT champions' only	Centrally available	1st and 2nd line support structure	Define support services in the form of Service Level Agreements	
Staff in the following technical ICT areas:	Network management only	Network management Administrative system analysis and design	Network management Administrative system analysis and design plus Hardware maintenance and repair and Database Mgt	Network management Administrative system analysis and design Hardware maintenance and repair Database management plus Intranet and internet application development and Help desk	
Staff in the following ICT functional areas (within the user organizations):	Sys. Admin. only (e.g. library and archives system, finance, student registration system, human resources, etc)	System maintenance & control (e.g. library and archives system, finance, student registration system, human resources, etc)	1st-line user support	System administrator for online courses Instructional technology (to combine pedagogy with technology) 1st-line user support	

Conclusion

It is important to assess the maturity level of ICT infrastructure provided by a university as it will indicate the university's competitiveness and ability in achieving the WCU status. The assessment will also mark the competitive ability of the university's in being at par with other well known and established universities in the perspective of ICT. At the same time, the university would also be able to assess the appropriateness of the ICT infrastructure provided in meeting the current ICT trends and requirements.

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