EVALUATION OF IMPLEMENTATION ON INFORMATION AND COMMUNICATION TECHNOLOGY IN HIGHER EDUCATION INSTITUTIONS IN INDONESIA USING THE IT BALANCED SCORECARD (CASE STUDY : SATYA WACANA CHRISTIAN UNIVERSITY, SALATIGA)

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ABSTRACT

The Implementation of ICT can improve competitive advantage of SWCU. Assessment of the ICT performance has not been done periodically, but only based on complaints from other units. This study will evaluate ICT implementation in SWCU using IT Balanced Scorecard. The purpose of this study is to look at ICT application in SWCU from the user's perspective and provide recommendations for the improvement in ICT management for the process of the services towards stakeholders and also recommend the implementation of improvement process of e-learning, so it can reduce problems in the future. Results showed that the users are satisfied using ICT and ICT application makes administration and learning process become more effective and efficient. This condition influenced level of students who withdrew and increased number of new students who enrolled. In addition, Development model of e-learning in SWCU must consider some factors, such as : participants, environment, contextual, technological, and educational functions.

Keywords: information and communication technology in education, IT Balance Scorecard, User Orientation.

INTRODUCTION:

Higher Education institutions do not miss to utilize Information Technology (IT) in implementing its core activity of academic services. The use of IT in educational institutions cannot be separated due to the demands from stakeholders (Indrajit, 2008). The increasing number of document preparation and data distribution about the use of Information and Communication Technology (ICT), urged the Ministry of National Education (Depdiknas) to apply ICT into the educational system. The goal is to improve the efficiency of management and administration, improve communication, and support the goal of the curriculum and learning in the classroom. The use of ICT for learning activities in universities in Indonesia is more conducive to the issuance of the Decree of the Ministry of National Education (SK Mendiknas) in 2001 which encourages conventional universities to conduct distance learning system (dual mode).

Satya Wacana Christian University (SWCU) is one of the Universities that has used ICT as infrastructure to provide services for students, lectures and the entire staff and help the implementation of the activities throughout all the unit. In carrying out its core activity of providing educational services, SWCU was supported by a service bureau that runs the academic administration, that is called Administration and Academic Bureau (BAA). In carrying out its duties, BAA is supported by IT, that is called Satya Wacana Academic Information System (SIASAT) where the development of Information System itself was done by the Bureau of Information Technology Systems (BTSI). SIASAT is an application used to record the Academic administration data of every student starting from the entry (Admission) to the exit (graduation). All students who were listed as students SWCU, has the right to access the application via the homepage institution. This application is important to know and master by every SWCU student because each semester students can see the financial obligations that should be paid, conduct the course registration, and see the results of the study.

For the learning process, SWCU is also implementing e-learning in which the course material is presented electronically. Communication between lecturers and students can be done anytime by e-mail if you prefer communication in private and/or use the chat forum if you prefer an open communication. For the lecture announcement and material have been uploaded on the website. The use of ICT in the form of e-learning will continue to be improved in SWCU in order to develop a model of distance learning.

Performance measurement of Academic Information Systems at SWCU found that some of the facts that the success of implementing SIASAT in providing qualified information as a whole, is not satisfactory for students, although for one of the factors is *Timeliness* which makes students satisfied but *Standardization* and *Understandability* do not make them satisfied (Haryani and Pranoto, 2006). Students expressed their dissatisfaction towards SIASAT, on the other hand the understanding and participation of students are also low (Haryani, 2008). On Son and Mary's research (2011) using the COBIT Framework to assess the performance of SIASAT found that the SIASAT has adequate *internal controls* to support academic services, but it still needs necessary improvements in some *control process* of COBIT IT, that is DS 7 *Educated and Training User* and DS 8 *Assist and Advise IT Customer.* In addition, from the earliest observations known that monitoring and evaluating towards the performance of ICT has not been carried out periodically and often occurs due to human error. This happens because the monitoring and evaluating of the ICT performance is only done if there are complaints from the unit ICT services.

Based on this, the study will attempt to evaluate the implementation of ICT-using IT *Balanced Scorecard* in Satya Wacana Christian University especially from the perspective of the user (User Orientation). The results of this study are expected to provide recommendations for the improvement in the management of ICT services to the stakeholders and also recommend the improvement implementation process of e-learning in order to reduce the risk of problems in the future.

LITERATURE REVIEW:

THE CONCEPT OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) IN EDUCATION:

Information and Communication Technology (ICT) includes two aspects, namely the Information Technology and Communication Technology. Information Technology includes all matters relating to process, use as a tool, manipulation, and information management. Communication technologies include all matters relating to the use of the tools to process and transfer data from one device to another. Therefore, mastering the ICT means the ability to understand and use ICT tools in general, including the computer (Computer literate) and understand the information (Information literate) (Noni, 2010). The technology here includes computers, the Internet, broadcasting technologies (radio and television), and phones. UNESCO (2004) defines that ICT is the technology used to communicate, create, manage and distribute the information. While in the world of education, ICT is used

in the online learning process or so-called e-learning. Thompson, Ganxglass and Simon (Simamora, 2003: 351) defines e-learning is a learning experience which is delivered through electronic technology.

IT BALANCE SCORECARD:

The balanced scorecard can be applied to the IT function and its processes as Gold (1992, 1994) and Willcocks (1995) have conceptually described and has been further developed by Van Grembergen and Van Bruggen (1997) and Van Grembergen and Timmerman (1998). Table 1 shows a standard IT balanced scorecard. The *User Orientation* perspective represents the user evaluation of IT. The *Operational Excellence* perspective represents the IT processes employed to develop and deliver the applications. The *Future Orientation* perspective represents the human and technology resources needed by IT to deliver its services. The *Business Contribution* perspective captures the business value of the IT investments.

Table 1 Standard IT balanced scorecard (source: ISACA 2004)

USER ORIENTATION How do users view the IT department? **Mission** to be the preferred supplier of information systems **Strategies** • preferred supplier of applications • preferred supplier of operations • vs. proposer of best solution, from whatever source • partnership with users • user satisfaction	**BUSINESS CONTRIBUTION** How does management view the IT department? **Mission** to obtain a reasonable business contribution of IT investments **Strategies** • control of IT expenses • business value of IT projects • provide new business capabilities
OPERATIONAL EXCELLENCE How effective and efficient are the IT processes? **Mission** to deliver effective and efficient IT applications and services **Strategies** • efficient and effective developments • efficient and effective operations	**FUTURE ORIENTATION** How well is IT positioned to meet future needs? **Mission** to develop opportunities to answer future challenges **Strategies** • training and education of IT staff • expertise of IT staff • research into emerging technologies • age of application portfolio

PREVIOUS RESEARCHES:

Hardhono study (2002) found that PT Pos Indonesia has been providing internet facilities to 116 cities in Indonesia, so it helps in speeding up the increase in the number of Internet users of Higher Education in the district/city. The demands of the stakeholders in making the universities in Indonesia use the Information and Communication Technology is because in doing its function as educational providers, universities also have relationships with other entities (Indrajit, 2008). Here are the entities that have a relationship with a higher education (Figure 1). This higher education can manage these entities, so that the objectives set out in the organization's vision and mission can be accomplished.

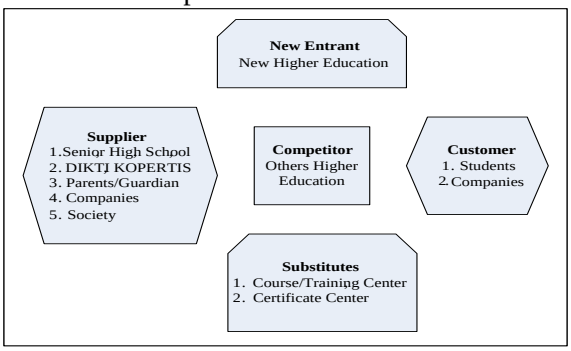

Figure 1 Entities related to Higher Education

The study, conducted by Diane E. Lewis in 2001 (Lewis, 2002) known that about 42% of 671 surveyed companies

have implemented e-learning program, and about 12% are at the stage of preparation/planning. In addition, approximately 90% of national higher educations also rely on various forms of electronic learning, both for educating the students or for the benefit of communication among lecturers. Such progress is determined by the positive attitude of the society in general, business leaders, students, and education personnel in particular towards computer technology and the Internet. A positive attitude of the developed society towards the computer technology and the Internet can be seen from the increasing number of users and Internet service providers.

Universities in Indonesia did not have a specific model of the framework when they build their academic information system (SI), so Mutyarini and Sembiring (2006) created an academic architecture Information system model by adapting the architecture of Monash University which used TOGAF in order to achieve the mission of Tri Dharma higher education. The research conducted by Prabowo (2007) found that the use of IT *Balanced Score card* in high education has not been done much, but by paying attention to the effectiveness of this method, the universities need to keep the ICT organization as well as evaluate the success of the development systems/applications, the development of computer and network investment, quality of products , ICT services, and improving the quality of human resources.

In addition, Van Grembergen's research (2000) discuss how the IT *balanced scorecard* (IT BSC) can be linked to the business balanced scorecard (BSC BU) and in this way support the IT/business alignment and governance processes. As for the aspects considered in the application of IT in IT-BSC method, are *corporate contribution*, *customer* (*user*) *orientation, operational excellence and future orientation*. Saadi and Suhardi Research, (2006) planned a method to use IT-BSC in performance measurement of implementation Enterprise Resource Planning system (ERP) at the University. The method is developed to formulate a strategic plan in accordance with the mission of educational institutions in order to continue to survive in the business competition.

While the previous research on IT in SWCU as the research object, include the study of Maria and Haryani (2011) who found that the supervision and the assessment towards the IT performance in SWCU have not been carried out periodically but only if there are complaints from the users (in this case is the working units) about the IT service. This research produced a model of information audit system which is developed using the COBIT framework especially for delivery and support (DS) domain. Maria's research (2011) also found that so far the IT management in SWCU has been done, but it has not been done using the method and structured approach. Maria's research, et al (2012) found that IT in SWCU has been well managed where IT processes to support business goals has been standardized, documented and communicated well. There should be continuous monitoring and evaluation of the IT in SWCU, so the quality of IT services in SWCU can be improved day by day in accordance with what is expected.

RESEARCH METHODOLOGY:

This type of research is a descriptive study in which the research results presented in a description of the qualitative and quantitative. The research was conducted by means of case studies in which this study site was purposively selected namely Satya Wacana Christian University (SWCU). This study will evaluate the performance of ICTs in particular from the point of view of the users (user orientation), where the focus of the user orientation is the ability of ICT to meet the needs of internal and external ICT users.

The data used in this study consisted of primary and secondary data. The primary data obtained from the interviews with the leaders of Higher Education, Bureau of Information Technology and Systems (BTSI) which is the maker and supervisor of ICT, and ICT users ie students. For the research instrument, we used questionnaires and user satisfaction survey on the implementation of ICT at the institution. Completion of the questionnaire was done by using direct interviews with respondents and in the form of Focus Group Discussion (FGD). While the secondary data were obtained from various reports and publications relevant to the study.

The population of this study, is all ICT users in academic and administrative activities and also the use of e-learning in the learning process in SWCU. The sample which is going to be used as the unit of analysis will be taken by using simple random sampling, that is a technique with the method of random sampling disregarding the strata (levels) in the members of the population. Each unit member of the population has an equal opportunity to be selected as the sample. The steps of this study are presented in Figure 2

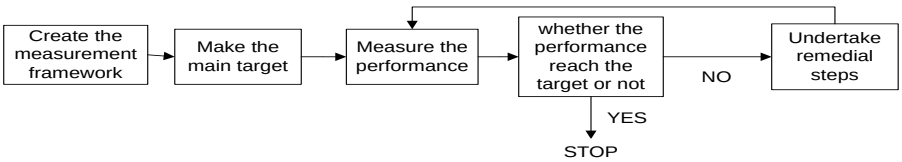

Figure 2 : Steps of this study

RESULT AND DISCUSSION:

Satya Wacana Christian University, Salatiga is a private university that has been using ICT to support its operations. Business processes in SWCU can be classified into two main parts, namely the process, and supporting processes. As like other educational organizations, the main process focuses on the implementation of Tri dharma college at the institutions such as lectures, laboratory work, on the job training, the implementation of the final project, research and training, and the implementation of community service. While the supporting process group includes: academic administration, student and alumni, financial administration. This makes the role of ICT in SWCU not just as a supporting tool but also has become a strategic activity, and also not only for the simple activities but also the complex ones, and it is a kind of process management which moves towards the content management. Figure 3 below shows the role of ICT in SWCU

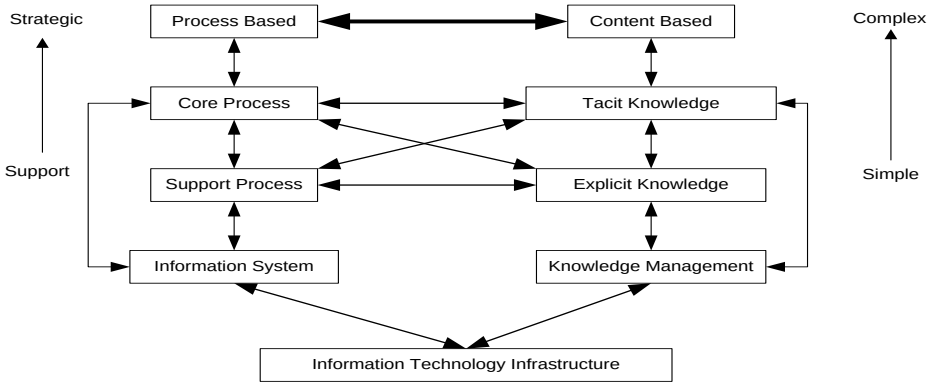

Figure 3 : The role of ICT in SWCU

ICT Implementation Evaluation results using IT Balanced Scorecard to User Orientation

From the user side, the application of ICT in SWCU is expected to improve services and ensure that services given are always on time and reliable, so that the consumer/user feel satisfied. If it is related to the purpose of SWCU in relations with SWCU mission, that having the effort of seeking the establishment and fostering generations of community leaders who are not only mastering the knowledge and expertise in a particular field, but also have a high awareness of devotion to the community. So, with a large number of students, this university can achieve the vision and mission to participate in the intellectual life of the nation as a higher education which is chosen by the society. Therefore, the implementation of ICT is necessary to evaluate whether it has already achieved the goals of SWCU or not. The ICT that is evaluated in this study includes the use of information systems and Internet technologies for academic and administrative activities in the learning activities in SWCU which is analyzed by using IT Balanced Score card from the point of view of the user orientation. Well-managed ICT is expected to improve the satisfaction of users whether they are the students or the SWCU employees, from the aspect of customer satisfaction. The framework and the target of the ICT implementation evaluation in SWCU from the point of views of the user are presented in Table 2 below.

Table 2 : Framework and the target of the ICT implementation evaluation in SWCU from the users points of view

Orientation	Aspect	Business Goals UKSW	Measurement	Target	SWCU Strategy
User	Customer satisfaction	• Increasing the ICT user satisfaction in SWCU • Establish service continuity and availability • Achieve cost optimisation of service delivery • Offer competitive products and services • Create agility in responding to changing business requirements	Level of satisfaction for ICT users	100%	The use of integrated applications between academic activities, accounting and finance, as well as research and community service.

In order to achieve the business goals of the user that are the students, Table 3 below presents the initiative implementation of ICT in SWCU both for academic and administrative activities and the learning activities.

Table 3 : The initiative implementation of ICT in SWCU

Orientation	Initiative Implementation of ICT in SWCU
User	• The use of e-learning known as flexible learning which can be accessed at http://flearn.uksw.edu/ for student learning process. • The availability of a computer lab for laboratory practice lectures which are also equipped to have a teleconference using the internet. • The discussion of the course not only done in the classroom but also use e-learning and /or group discussions through blogs or face book • Lecturers' works, research reports and students' work such as students' thesis are managed in an information system with the name SWCU institutional repository that can be accessed by students and lecturers in http://repository.library.uksw.edu/ • The use of e-diglib to access the books used for courses that can be accessed in http://webopac.uksw.edu/uhtbin/cgisirsi.exe/x/x/0/49 • The availability of Electronic Journal service that contains a collection of electronic journals published by SWCU that can be accessed in http://journal.komunitas.uksw.edu/ • The availability of research information system that contains information about faculty research and publication work together with the students which can be accessed in http://ris.uksw.edu/ • Students and parents can access student information studies for each semester, billing information tuition per semester, get transcripts, class schedules and information services through Short Message Service (SMS). • Student Registration can also be done via SMS. • The use of ALAM machine (Automated Student Academic Services) to access the Academic Information Systems and Finance for students. • Website that contains updated information for admission. • Registration and entrance test conducted online. • Payment of student financial obligations using the online payment system, where the payments can be done through banks that have agreements with SWCU, so It does not require validation from the finance department because the banking system has been online with the system in SWCU • The availability of the websites containing job vacancy information for SWCU alumni which can be accessed in http://www.uksw.edu/swca/

The survey was conducted on students who use ICT in academic and administrative activities and also in the e-learning activities. The Number of the questionnaires are 400 questionnaires. Of all the students who got questionnaires, only 271 respondents who complete and return the questionnaire. The rest did not complete and return the questionnaire for various reasons. Based on the test results for each statement in the ICT user satisfaction in SWCU, it can be concluded that all indicators pass the validity and reliability test. It can be seen from the P-value of t-test, which stated that indicators which pass the validity and reliability test are indicators that have a P-value below 0.05 and Cronbach's Alpha> 0.6. Thus, the research instruments can be used to measure the satisfaction of the ICT users in SWCU. The result shows that 69.74% users are satisfied with the use of ICT in SWCU and the rest do not. The application of ICT makes the administration and the learning process become more effective and efficient. This influenced the decrease on the levels of the students who withdrew from SWCU and increase the number of new students enrolled at SWCU as shown in Table 4 below.

Table 4 : The number of new students and active students in SWCU (processed secondary data)

Measurement	Academic year 2011/2012	Academic year 2012/2013
New students	3207	3669
Active students	12.266	12.450

Evaluation results found that the application of ICT in SWCU can be used as a tool in setting the content of the learning because now most of the students have already had their own computers, so it is possible to develop a Personal-Interactive learning packages such as ways to take advantage on educational software like: Computer Assisted Instructional (CAI) or Computer-Based Training (CBT). But the use of sophisticated instructional

media will still not be able to fully replace the role of the lecturer. This is because the values of norms and personal touch will be difficult to be implemented in the internet learning process, so the learning principles and teaching of communication need to be designed like a conventional learning by taking into account some factors: the participants, the environment, contextual, technological, and educational functions.

The use of flexible learning (f-learning) is helping students to learn independently and learn from each location. Moreover, f-learning applications in SWCU helps the students to evaluate the learning progress in which the Grade Point Average (GPA), cumulative grade point average (GPA) and information of course schedule are presented accurately and timely. This is good because the presentation of the accurate and timely mark can help students to find and evaluate the results and the process of their own learning. While the presentation of the accurate and timely teaching and learning schedule will help students to organize their study time so that it will cause a positive result for the academic achievement of the students. Giving the same opportunity in asking/having discussion for every student either through email and chat forum is considered very helpful for the students to understand the material being studied so that a positive impact on academic achievement will be shown by the average increase in the mark of each student.

Evaluation results found that the use of ICT in SWCU is very appropriate because Indonesia consists of thousands of islands spread over a vast area, and is inhabited by over 200 million people with a non-homogeneous distribution. It is realized that this condition becomes an obstacle when we are going to apply the conventional educational system (face to face). The application of ICT helps parents to supervise the process of learning for their son/daughter by using SMSInfo service. Moreover, in terms of cooperation SWCU with the banks especially in terms of paying the tuition fee, it can be said that it is very helpful for parents to be able to do the payment transactions from the student's home town without having to come directly to the institution. Evaluation results also found that students are very satisfied with the activities carried out by the SWCU for its on-line admission system especially for new students coming from outside the area, because they do not have to bother to come to Salatiga for registration, testing and financial liabilities.

Table 5 presents the aspects that influence the decision of students and prospective students when choosing to study at SWCU. These aspects should be considered by the leaders of the university when it was about to undertake the development of ICT in the institution.

Table 5 Aspects that influence customer decisions in SWCU

N	Aspects that influence customer decisions in SWCU
1	The ability of the lecturers in mastering the lecture material and creating an active learning atmosphere in the classroom.
2	Modules/complete study material, easy to understand and easily accessible
3	Lecturers are easily contacted/met for consultation
4	Room Facility and equipment (classroom, lab, discussion, Administration, laptops/computers, LCD, overhead projector, whiteboard, wireless) are adequate
5	Adequate library facilities
6	Access for getting the Information about the value of GPA and Cumulative GPA accurately (thorough and timely)
7	Administrative procedures are good and straightforward
8	Quick and responsive handling in dealing with complaints or problems experienced by students and prospective students
9	intimate and close relationships between students, lecturers and employees
10	Good image of SWCU in the community

Evaluation results found that students who are not satisfied with the use of ICT in SWCU are due to the lack of readiness of the infrastructure supporting the learning process of e-learning owned by the institution. For example, the limited bandwidth internet, wifi internet connections which are often off and/or slow because of full network thus this condition effects the students when they are going to download course materials, communicate with lecturers and also when they are doing the online test. The specification of the out off date computer lab is also became one of the complaints from the people who are the respondents in this study. If the application of e-learning in the learning process and the infrastructure is up to the student, then the problem arises is that a student is not ready to deploy an e-learning. This is because not all students have private facilities such as a laptop and/or lease the internet in a cybercafé to support the learning process using e-learning. The lecturers' Readiness in the application of e-learning in the learning process is minimized because there are many

teachers who have not upload the material on the web f-learning institution. Therefore, to obtain maximum results from the application of e-learning, the role of the head of the University is needed in the form of e-learning policy. These aspects should be considered by the head of the university when they will make the development of e-learning models in SWCU

CONCLUSION:

Information and communication technology (ICT) can improve an organization's competitive advantage in particular institution. Therefore, the implementation of ICT in SWCU need to be evaluated by using the IT balanced score card especially for users. Evaluation results show that most users are satisfied with the use of ICT in SWCU. The application of ICT makes the administration and the learning process become more effective and efficient. This condition influenced the level of students who withdrew from SWCU and increased the number of new students who enrolled at the institution. However, in order to improve the performance of SWCU in the future, monitoring and evaluation needs to be done on an ongoing basis on ICT in SWCU, so the quality of the service in SWCU could be improved day by day in accordance with what is expected. In addition, the development model of e-learning in SWCU must consider some factors: the participants, the environment, contextual, technological, and educational functions.

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