

ICT Culture of The Implementation of Academic Information System (AIS) at Higher Education (Case Study: Higher Education in The City of Bandung)

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Abstract. Culture describes value, habit, and work environment of an ICT-based organizations which have implemented based-ICT information system to run their organization, for example academic information system at higher education. The purpose of this study of ICT culture is to evaluate the progress of ICT culture at higher education environment in supporting the success of the implementation of academic information system in Bandung City. By using descriptive research analytical method, the population in this study involved 37 higher educations in the city of Bandung which adopt ICT in their academic and administrative system that runs undergraduate (S1) program. This study shows that management and lecturer group respondents evaluate that ICT culture at higher education is very high, while students evaluate that ICT culture at higher education is high. The developed ICT culture are 1) the belief of ICT; 2) The value of implemented ICT; 3) developed attitude and habit; and 4) ICT skill

Keywords: ICT Culture, Academic Information System Implementation, higher education.

1. Introduction

Culture of information and communication technology (ICT) is the foundation of this ICT-based information systems effectively. The development of ICT culture will drive the use of information system because of the context that support the system. Culture describes the values, habits, and work in an atmosphere of public organizations that are bound and familiar in using ICT. These conditions will strongly support the implementation of ICT-based information system including academic information system in college that everyone is ready in terms of his skills, his attitude, his perception, and the atmosphere of work.

The study of ICT culture started from the TAM model developed by Davis, TAM is a form of scientific research in the study of the IT diffusion [1]. From this studies emerge theories of culture in IT. From the results of this study, there are a lot of researches of IT culture states that culture plays a very important role in the diffusion of IT [2].

Slamet and coauthors [3] states that to be accustomed with ICT describes values, habits, and work atmosphere of ICT-based public organizations. Thus ICT binding in their working atmosphere and binding to all the people in those organizations. On the other hand, Straub et al. [4] states that culture is important in explaining the shape or pattern of the use of IT in an institution. It means that the activity and behavior patterns of the users or the implementers or who involved in the management process within the organization is a reflection of the culture of technology.

The culture of ICT is the change driven by external factors or established by the circumstance made consciously and deliberately. With the perception that ICT is a gift and the ease for organizations, the level of acceptance of ICT will increase. The use of ICT in the achievement objectives activities of the organization will gradually form a new culture in the organization.

There are several models built to analyze and understand the factors that affect the acceptance of the use of computer technology, including the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), and the Technology Acceptance Model (TAM) [5], [6]. TAM Model was actually adopted from the model TRA, the theory of reasoned action with a premise that a person's perception and reaction to it will determine the person's attitudes and behavior. Therefore, reactions and perceptions of the users of ICT will also affect attitudes in accepting ICT. In the use of ICT in higher education, particularly in the areas of

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management and support, ICT perceived on the basis of the benefit and the ease of the use will be one of ICT acceptance benchmarking. Model of psychological theory developed from TAM that describes the behavior of the user of computer users is based on belief, attitude, intention and user behavior relationship. This aims to describe the key factors of user behavior to the acceptance of the use of technology.

The figure describes how and why individu use informasi technology system.

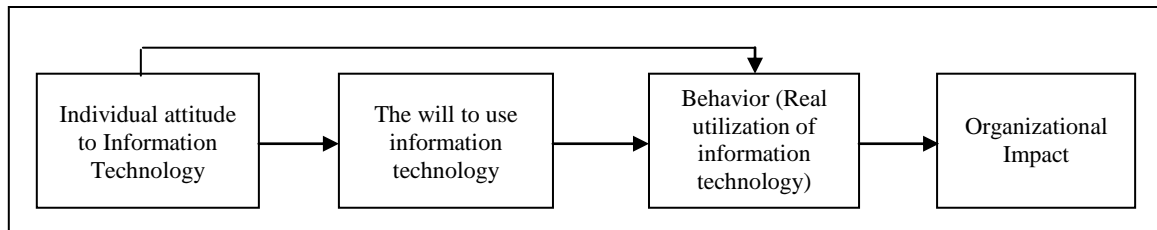


Fig. 1: The Establishing Model of IT Culture [4]

The study of culture in the implementation of IT in order to run this organization can also be traced from inefectivity and inefficiency the utilization of IT itself. All acknowledge, investing IT in the process of management costs, and also in the field of investment, IT has become a trend in every organization. Of the amount of energy that should be devoted by the fund and managing IT, Jasperson et al. [7] see that organizations can use less of the potential function of the application IT they installed in the organization. They are just a few of the benefits of utilizing IT in running their business. Of the phenomenon described above, Jasperson et al [7] concludes that for this IT investment which institutions run are less attention for the aspects of culture itself, it is the new culture of people or organizations because of the presence of IT in their environment. Post Adoptive Behavior which is a part of the cultural studies that Jasperson focusing. In explaining why the inefektivity and inefficiency of IT implementation occurs. In addition, Lavonte and Rivard [8] describes the inefektivitas of IT implementation is due to the refusal of the IT implementation itself. Lavonte Model and behavior process illustrates that Rivard denial IT implementation is resulted from a long process. Originated from the initial conditions where the level of understanding of IT from invidu and organizations that are in a low position, then they are confronted with the failure of the new IT systems they develop. The level of understanding of the interaction with the IT system failure occurs, then it made a negative perception of IT, which is considered as one of the threats to the existence of himself or the achievement of the goals. Then refusal behavior emerges.

The aim of this study to assess the ICT culture developed in the higher education community in supporting the success of academic information system implementation especially in Bandung City.

2. Methodology

By using descriptive research analytical method, the population in this study involved 37 higher educations in the city of Bandung which adopt ICT in their academic and administrative system that runs undergraduate (S1) program. While for the institutional sample, I used proportionate random sampling and it is involved 18 higher educations consisting of 8 universities, 3 institutes, and 7 colleges. For faculty sample, 988 persons are lecturers and 1581 persons are students. Measurement of the samples was done using the formula of Yamane [9]. The data obtained from the study then analyzed with descriptive analysis. Descriptive analysis seeks to expose data or answers given by students as respondents to the number of questions posed in the form of a questionnaire, so that the results will clarify issues that will be examined.

3. Result and Discussion

There are four sub variables describing ICT culture variable that developed at higher education, they are:

- The belief in ICT
- ICT Norms
- Habits and Atitude
- Skills

In general, ICT culture is evaluated by 3 group of respondents as on the table below.

Table. 1: Recapitulation of ICT Culture Assessment Based on Sample Group

Sample Group	ICT Culture Assessment			
	Very High	High	Less High	Low
Manager and Staff	38,9%	61,1%	0%	0%
Lecturers	20,7%	75,2%	3,95%	0,1%
Students	99,1	0,8	0,2	0%

The respondent's group management and lecturers assessing ICT culture developing in college is high, while for students is very high. Most of them assess it high and very high, although there are some small portion for less high. The are categorized into into 4 components. As for the components are: 1) beliefs about ICT itself; 2) values of the implemented ICT; 3) attitudes and habits evolving; and 4) ICT skill. Of the four components, the table below shoes the ICT culture in higher education.

Table. 2. Recapitulation Assesment of ICT Culture Components at Hgher Education Based on Sample Group

ICT Culture Components	Very High	High	Less High	Low
a. The Beliefs in ICT	61,1	38,9	0	0
b. ICT Norm	55,6	44,4	0	0
c. Habits and Attitude	22,2	77,8	0	0
d. Skills	44,4	55,6	0	0
Average	45,8	54,2	0	0

Just as in the explanation in this total score in the presentation of data that categorize the cultural conditions status of ICT at higher education is very high, the ICT culture of the higher education community is good.

The high cultural level of ICT of higher education community is one of the height ICT culture of society in General. Current progress of ICT in Indonesia are in the top level. Indonesia had made history in the pursuit of their lack in the field of ICT today. Hopefully this is one of the good things for the progress of ICT in Indonesia.

Among college communities, there is a belief that information belongs to everyone. Anyone have the same rights to be able to access the information but still concern to the proportion of propriety. The belief in equality is translated in acadamik information systems entities with the sharing of information in each units vertically or horizontally.

Regarding the evolving ICT values, there are some values developed at higher education, they are: 1) transparency; 2) decentralization; 3) integrative; 4) democratization; and 5) independence. These values provide color in the activity of the college community in performing their basic tasks and functions. Everyone can get all information related to the raw data, a process occurs, and the product of information generated through the media provided the institution (platforms provided in all corners of the campus, booklet or bulletin distributed periodically, widely publicized report in the campus, or on the site of the campus).

Academic Administration Management Unit was broken up into small units with unique tasks and independent information management activities. The units handle the subcategories in the administration of the academic of the colleges. In other words, the work of academic administration is broken down into some work and distributed it to some existing units in the college academic administrative units. Although each units work do anything by theirselves, they are part of the integrative college academic administration. The academic administration is also an integral part of the college management information system in General. They can be connected and sharing information. The financial administration section can access academic administration section and vise versa.

Democratic values in the management of academic administration is one of the values where academic administration management process run in higher education. Academic administration system can be an equivalent access providers for academic data, AIS can also democratize knowledge, and in the community of democracy, AIS should serve as a Center for academic data for all, not just for certain group such as

college structures. Universally, the role of the academic administrative system in favor of democracy is to ensure that every citizen of the college understand his rights as the *civitas academica*, so in the end the community college informed can be stimulated to do activities to organize and provide the best service to all stakeholders.

Independence is one of the values in the process of academic administration of the College. Automation either through ICT or manual assistance has contributed quite significantly to the self-sufficiency of the actors or stakeholder itself. The users of information can make their own efforts to fulfill the information needs through on line available platforms on or through a certain units assigned to do that. The units which input or process, or print or publish the results/products systems can work alone with the help of sharing data among units.

There are characteristic of individual attitude and habit who ICT-oriented, they are:

- 1) *Self-decision making*. Because something can be run automatically, the routine problems can be determined automatically. Then decision making is not hard to do. In addition, each users or individual managers can make their own decision making because the data is complete then decision making is easier. For example, to know whether a student should've or shouldn't have taken their thesis, he can see it from the computer.
- 2) *Quick Service*. By the short distance and time, the service could be faster. Students do not need to stand in line or come in person to the administrative part only to find out the results of their study in a semester. Computer online can give you an answer that matters. The management of tasks and classroom lecture can also be automatically and quickly made through automated computer simulation.
- 3) *Efficient*. Automation and online system could save the cost, effort, and time. That's one advantage of the efficiency of ICT, although to apply ICT need a high cost, compared with long-term benefits, this step is more profitable.
- 4) *Self-service*. The process of data input, the process of making decisions, and obtaining the results can be done by everyone. ICT allow and provide opportunities for that. Data Input could be done to everyone, everywhere. Lecturers enter score without having to wait for the academic division to do it. Students can access the databases at home by themselves.
- 5) *Shairing information*. Sharing information is one habit that is inherent in the culture of ICT. The Data is the property of all units, it is the concept for sharing information. Effective decisions are built on the basis of data and information. The completeness of the data and information requires each part in ccolleges "must: share information.
- 6) *Flexible*. Rigid bureaucracy in the administration of the academic affairs can be more flexible by ICT. Ability to remember and record with a massive volume creates flexibility of service and decision making.

Skill is the internalization of all ICT value effort internalized in the individual works. In the context of this study, ICT skills is related to the individual's ability in running ICT or make use of ICT and academic information system. These skills indicate how far the college community is able to show their knowledge and insights, values, and their beliefs in psychomotor behavior looks.

ICT skills is also supported by the extent of understanding and mastery of ICT literacy. Mastery of ICT literacy skills also determine the individual skills. This skill affects how far someone able to display his motoric skills in running or utilizing ICT.

This reflects that the effectiveness of implementation of AIS ICT-based requires that everyone has been ready in terms of skills, attitude, perception and work atmosphere. If it doesn't met then it can contribute negatively to the performance of the institution. This is in line with the opinion Jasperson et al [7] that the implementation of ICT run by institutions is still less attention to the cultural aspects of the new culture of people or organizations because of the presence of ICT in their environment, it would lead to inefficiency and inefektivitas implementation of ICT in various aspects of the management.

Related to ICT Human Resources, the high competence of workers give a confidence that the utilization of ICT-based information system will provide a lot of ease in generating quality services. This certainly will encourage employees to be more motivated to improve performance through system integration in doig their tasks and the bring up creativity in producing good quality services to users.

4. Conclusion and Recommendation

ICT culture at higher education in the city of Bandung is high described by a situation where college community embrace values and habits depicting their literate and aware of the ICT. They know the function, meaning, and the philosophy of the ICT and able to adopt it their daily activities. Work atmosphere in higher education describes the dipendence of the college components (people, tasks, process interaction, organizational behavior) to ICT. If ICT culture is developing positively in colleges environment, it will be a fresh atmospher for academic information systems particularly, and in information management generally.

It is suggested to do further study on the utilization of ICT and its impact on performance and academic achievement of students in college by making casification of higher education based on maturity level in the application of ICT at higher education.

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