Innovation Strategy Services Delivery:  
An Empirical Case Study of Academic Information Systems in Higher Education Institution  

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Abstract. Information Communication and Technology (ICT) gives a lot of contributions in the rapid transformation in global society. The people have to adapt in evolving claims of this trend in order to survive from daily struggles. In this 21st century Indonesians compel themselves to go with this flow and have to keep up with countries over the world. Hence, higher education institutions must undertake this fast transformation in serving the stakeholders real time by supporting of ICT as at University ABC in Jakarta, Indonesia. The existing Academic Information Systems (AIS) is not yet fully used for moduls usage and some of them are still idle. This paper is an empirical case study and the method used is descriptive research by using the existing data recorded in the systems then analyzed accordingly. This results study will give suggestions for better service delivery to the institutions.

Keywords: innovation strategy, service delivery, AIS, higher education, case study.

1 Introduction

Service delivery becomes the main key strategy in achieving the goals in this era of century development. Most of the organizations over the world always do reviews and redesign on their services delivery toward their customers for the sake of growing and sustainability of their businesses, companies, governments, non-governments organizations and also higher education institutions. For the higher education institutions for example, the presence of information communication technology can support the provision of delivering services with real time output to the need of stakeholders such as transcript of records, load of teaching, syllabus, grades, student finance reports and others immediately. The usage of information communication technology in the institution can be used as a competitive advantage of the institution because of good service delivery to serve their stakeholders. Therefore, the director general of higher education, Ministry of Education Department Republic Indonesia advocated the use of information communication technology in higher education management and

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governance in conducting service management for the quality of services. In this
global era, quality administrative is required, as Purba, John Tampil [1], towards the
global competitions as well the needs of market place, each higher institution shall
evaluate their existing performance of services to face hyper and global competitions.
Besides, the regulations from government are also to force any higher education institu-
tion to comply all regulations accordingly. The service management shall have
quality of all the administrative activities such as on line registration systems even for
the new students and also the existing students, subjects, schedule classrooms usage
information and teaching learning activities such as; absenteeism, grades, syllabus,
lecturers absenteeism, etc.

The AIS data are growing from time to time because of the increasing of the num-
ber stakeholders or customers (students) are forcing the institution to improve and
upgrade the service delivery in enhancing better access of the stakeholders or custom-
ers’ needs. This way is chosen to ensure the availability access in delivering the ser-
tices to all the stakeholders. In providing the regulations, the management shall make
such services to meet the quality standard. The people who involved for the service
delivery must understand how far the utilization, availability and coverage access to
database that are often used. As the purpose of delivering services to meet the re-
quirements of the standards to the stake holders. Anwar, Chairil and Warnars, Spits
[2] in serving with the implementation of a service system of learning the academic
system is needed and it is a very vital things to implement the learning process contin-
uity and quality. Without an academic information system, the learning process will
not running well on learning process. In the world of education is equally important as
an example of the card study plan is one component of the terms in the study plan of
the students.

Swardi and Permatasari [3], information systems today has become important part
of the institution of higher education. Many higher education institutions using inform-
ation system as a solution of efficiency and competitiveness, but less of them have
the ability to accommodate many changes according to the growth of the institution
itself. That opinion added by Purba, John Tampil [4] as cited from the statement of
Lawson [5], during this period, competitive advantage rested variously on mainstream
variables like efficiency, quality, customer responsiveness and speed. In the new mil-
leennium, control over the above variables represents the minimum threshold to “play
the game”. Each factor remains important, but is unlikely of itself or as part of a
group to provide a sustainable competitive advantage. Today’s organizations face an
additional challenge the requirement to innovate, not just occasionally but often,
quickly and with a solid success rate. Wohlstetter, P., et al [6] the nature of services and
applications provided by the information systems group is also believed to have
change over time. The new strategic applications also tend to be targeted at the cus-
tomer or the distribution channel rather than on systems for internal efficiency.

In the case of University ABC Jakarta, one of the big and old universities in Indonesia,
in the year 2008 this institution still used semi computerized Academic Information Sys-
tems (AIS) with Microsoft Foxpro technology and desktop based application. With such
conditions, would certainly be very difficult for the university to be able to compete with
other universities that already have a fully computerized of academic information system.
At that time, there were a lot of works such as registration, classroom division, scheduling of lecture, absenteeism and etc, done manually and of course there were a lot reports for internal and external need, became delay. All the students should go to campus to see the grades and other information on provided bulletin boards, and the announcements of the grades from the lecturers are often delayed because of the process of grading is still done manually. In such cases, the demands of the progress of time the presence of technology and information systems needed by an organization that services to stakeholders can be implemented properly. There were a lot of complaints from the students and other stakeholders in regarding the delay of the announcement of their grades and consequences to the delay of re-registration for next batch semester. Noting that the management should make a breakthrough, the new top management of university initiated project on AIS applications in order to provide real-time service delivery to its stakeholders. For that it is needed innovation strategy in building AIS so that can manage all academic information and result optimization the service delivery of information in providing accurate, fast and better services to students in particular and all the stakeholders in general.

2 Literature Review

OECD[7], Innovation is already an important driver of growth in some countries. Firms in several OECD countries now invest as much in intangible assets, such as research and development (R&D), software, databases and skills, as in physical capital, such as equipment or structures. Much multifactor productivity (MFP) growth is linked to innovation and improvements in efficiency. Preliminary estimates indicate that in Austria, Finland, Sweden, the United Kingdom and the United States, investment in intangible assets and MFP growth together accounted for between two-thirds and three-quarters of labor productivity growth between 1995 and 2006, thereby making innovation the main driver of growth. Differences in MFP also account for much of the gap between advanced and emerging countries. This suggests that innovation is also a key source of future growth for emerging economies. (The OECD Innovation Strategy getting a head start on to morrow). The similar shall be implemented in the higher education institution for better productivity by using service delivery.

Strategy to implement the service delivery it is better to scan environment scanning in preparing and calculating the strengths, weaknesses, opportunities and threats. Let us see the strategy requirements; Purba, John T.[8] strategies must be flexible, requiring you to be sensitive and responsive to market changes. The first overriding imperative about markets is that they change. The second imperative is that you must try to know what is going on out there all the time or you will not know what is changing. The third imperative is that if you do not know what is changing you cannot respond. The fourth imperative is that if you cannot respond to changes your strategies will be unrealistic and will not work.

For the university purpose Phillips, Tim [9], Information Technology in all areas: departments, faculties, support services and all other organizational structures and groupings. Therefore all members of the University are stakeholders – students, staff and all others associated with the University of Bristol. IT Services-help, support, training, systems development, business and systems analysis, programme and project
management. All of these require clear, well defined, agreed IT management and governance structures in order to deliver the aims and objectives of this IT Strategy. Implementation of the IT Strategy will be managed through a set of inter-related programmes and projects. The IT Strategy builds on long-standing common sense principles of the Information Strategy. Strategy of the Service delivery will be based on good governance, project and service management, coupled with high quality reliable, sustainable IT Services. Good IT is needed to support the whole University and to enable excellence. Fig. 1 below describes the interrelated the university vision that valued which is truly enhanced by the use of Information Technology:

**Fig. 1.** Vision and Values by the use IT service in University of Bristol [10]

White, Susan [11], Information technology affects not only the delivery of academic content but also ancillary operations. If today’s students are more technologically savvy than the majority of the faculty, the implications for the academy surely include a wide range of opportunities to leverage the fruits of new hardware and software tools in ways that truly enhance the learning experience. This will require flexibility on the part of the faculty. In addition, as schools are more ratings conscious, new ways to innovate in the delivery of supporting services will emerge; institutions whose operating processes are most open to change will reap the most benefits. Purba, John Tampil [12], all most modern organizations implement and rely on Information Technology services to support their business processes and sustainability. As we know IT services are built upon the technical infrastructure, systems and application software. The set of processes that apply planning, organizing, directing and controlling the provisioning of IT services. Besides of the ICT development inside the organization the human resources shall also develop in achieving the good service innovation as such opinion as described by Six Sigma [13] at the heart of every services business are the opinions, behaviors and decisions made by people. Also of great importance in services settings are work processes, whether they are recognized or not. Until a process focus—rather than a task focus—is developed, the scope and "sticking power" of improvements will be limited. Analyzing and modifying human performance in these environments is as complex as any manufacturing situation – but the tools and methodology required to achieve the legendary improvements of Six Sigma are significantly different. Six Sigma for Services Companies Training is the first program designed specifically for professional services providers.
In delivering services to the stakeholders and customers the institution shall provide and concern on managing performance, managing people, managing resources, conduct planning, and managing services. Those are the requirements for working which others, improving services, setting direction, and demonstrating personal qualities. The figure below displays about them.

In the second article of Green, Matt and Gell, Lynne [14] comprises four subdomains: planning, managing resources, managing people, and managing performance. Ensuring the correct processes and infrastructure are in place will help to ensure that the services you oversee are fit for purpose. Any business planning process should be informed by patient or service user feedback, audit results, commissioners’ intentions, staff input, and best practice evidence. For Managing performance to achieve exceptional results can use performance management techniques to support, energize, and empower staff to improve their performance. A clear understanding of the principles of performance management of individuals should be sought, such as supporting poorly performing colleagues to improve through regular competency based review meetings to monitor progress.

Another opinion on service delivery in the integration with ITIL service management is the combination of service support and service delivery. The service delivery contains; service management, financial mgt of IT services, capacity management, IT service continuity management, and availability management. The service delivery
seems integrated with information technology driven. The integration of all services as display in the below figure.

![ITIL Service Management Diagram]

*Fig. 4. ITIL Service Management (Cousin, Carlos, 2010)*

Cousin, Carlos [15] Information Technology Infrastructure Library (ITIL) is recognized as the de facto standard for IT Service Management. ITIL reflects a process-model based view of controlling and managing IT functions. The approach is credited to W. Edwards Deming and his plan-do-check-act (PDCA) cycle. In 2009, the ITIL library consisted of the following 9 volumes: Service Support, Service Delivery, ICT Infrastructure Management, Security Management, The Business Perspective, Application Management, Software Asset Management, Planning to Implement Service Management & ITIL Small-Scale Implementation (which was added to the original 8 volumes). Three Key Objectives of ITIL are to align IT services to meet the needs of business and customers, Improve quality of IT services delivered and reduce the long-term cost of service. He continued that providing leadership of services and staff, consultants are also expected to pioneer and drive forward new models of service delivery.

3 Research Methodology

To explore the service delivery for Academic Information Systems (AIS) that has been implemented in University ABC Jakarta, Indonesia, the researcher used the existing data which have been recorded in the system that can be accessed accordingly. Through collecting and selecting the data about how the service delivery of Academic Information System that utilized by management as well as lecturers and stakeholders. The methodology used in this paper is descriptively. The descriptive analysis was done by giving the flows of delivering service data to the stakeholders and also by selecting and capturing the data related such as; figures and tables from the existing display data in the applications then analyzed and discussed accordingly.

4 Results and Discussion

As the one of the old big university in Jakarta the new management did innovation to overcome the problems raised from the stakeholders, so the Academic Information
System in Web based technology become their priority in the first year of services. Then they set up committees to do the AIS application technology by appointing the head information technology bureau to manage the project.

In business process, herewith the researcher describes flow of delivering services to the stakeholders; students, lecturers/faculty members, parents and management of the university are as the flow of the figure below. All data are stored in the server data storage which have been input by the data entry staffs in the colleges level. The total departments in the university are 25 which approximately five thousands students. They are served with eye contact teaching and learning activities, either in classrooms or in the laboratoriums.

Fig. 5 below is flow of information and communication technology of the Academic Information System in University ABC Jakarta. The services continue management systems are prepared in a big data with cloudly web based technology that can be retrieved in seven (7) days and twenty four (24) hours. The technology choiced due to the strategic policy of the rector of the university at that time.

![Service Delivery scheme to the stakeholders in University ABC Jakarta](image)

**Fig. 5. AIS Service Delivery scheme**

In the teaching and learning activities are all recorded and storages in the server, such as the absentism of students as well as lecturers from time to time and ofcourse automatically displayed in screen of computers, PDAs, notebooks, IP phones and other modern devices that suitable to the systems. The services of AIS were developed with Microsoft SQL Server 2008 data base application for the back end, and in front end with programming language Microsoft C# dot net. The persons of data entry staffs who responsible in every college they are also stay in the office of colleges to input data of the daily absentisms of the students and lecturers. For grades of assignments, mid semester, and final semester shall be input into the system by the lecturers according their subjects teaching. The students can continue to communicate with lecturers anytime, anywhere by accessing to the AIS server system. Such systems are not only to speed up services delivery but also would help ease the burden of staff in the teaching-learning process. This can be trusted because in this system some staffs functions could be taken over in a computer programmes which known as agent sytems.
In delivering services to the stake holders the management of the institution provides the good and high end ICT infrastructures such as hardware, equipments, antennas, and others devices which connected to the systems database. For availability management and service level management, the infrastructure communication inside and outside the campus supported by outside vendors such as: Internet Provider company, equipment suppliers, software companies and others. All of these combined with collaboration integration accordingly in giving service delivery to the stakeholders. The schematic of the infrastructures designed by innovative thinking with the existing situation and condition with more the one campus sites. The below figure can demonstrate existing ICT communication data infrastructures.

Fig. 6. Internet Provider service delivery inside the campus (University ABC Jakarta)

Fig. 6 above illustrates how the service delivery to the stakeholders by using the new ICT infrastructures which available in the site of the both campus in order to accomodate the needs of them. The network infrastructure has been used and managed day to day by the department of network and infrastructures of IT Division according to standard operating systems. There is a service desk avail in the department to handle if there is problems arised then continued to related IT engineer for solving the problems accordingly.

Fig. 7 below displays the modules of Academic, Students, Parents, Faculty members/lecturers, and for new enrollment students. The academic one give many services on line; this module used by top management, administrators, deans, head of bureaus, and others as specified in the regulation of hierarchies. This module can be used to give information which categorized public information, so the students and all stakeholders can use to see and to know the latest news in the campus, the example as displayed below:

> Home Page

Academic Information System

PENGUMUMAN


Fig. 7. Portal Academic Information Systems of University ABC JakartaSource: Portal University ABC, Jakarta Indonesia [16]
The module of students provides to serve to students which giving the information to such as; grades, finance, on line registration, syllabus, home assignments, study planning and others. In the module of parents provides the information about their children absenteeism, grades, finance (including the payments history) and others related. For lecturers/faculty members modules are displayed in Fig. 8 below; the lecturers can change the profiles such as password, address, researches, community development, seminars, syllabus, and others. This module also can be used to see the subject teaching loads records, absenteeism records. Besides the lecturers can used this module in giving information, home assignments, verification for students on line registrations, students’ leaves and entry the students’ grades. In addition, the results of Study Plan Card (Kartu Rencana Studi) is accountable to any party or parties both students of the university because of the process in accordance with the rules that have been standardized and enforced by the management. The stored data in the servers as set with the formula in database, can be used by the students and academic agencies such as the management of the institution itself. With the presence of these web-based AIS technology constraints contained in the system is done manually can be resolved. It is an idea to create software applications that are able to manage the administration of institution well, so that these constraints can be handled with this software. Having this software application is expected to provide solutions problems of service delivery quickly and accurately such as the Study Plan Card (KRS). So the expectation of services based on information systems can be implemented, especially to serve the students as customers must be served better and satisfactorily.

**Fig. 8. Module of Lecturer in the Academic Information Systems Portal ABC University**

The AIS application can be used by the lecturers to give the appropriate service delivery to the students, and for their Beban Kerja Dosen’s report (lecturer’s working load report) that give to the government each semestral period. Each lecturer can optimize this application systems many purposes as regulated by the inside institution and Department of Education and Culture or Department of Research and Higher Education Republic Indonesia as the regulator for education in the country.

Table 1 below displays the present or absenteeism of the lecturers and the students during the teaching and learning process in one semester. This system not available before the year of 2009 in the institution, all works like these were done manually so they took many hours to calculate the number of days or class attendance of the
students in one semester. As per regulation while the students cannot fulfill 75 percent of all classrooms attendance, the student(s) prohibited to take the final exam. As display in the below table the percentage of the attendance were automatically calculate by the machine of the AIS systems. This new systems is very helpful as the service level management for all respective management to know the accountabilities of all the lecturers and students performance especially from the classrooms attendance.

Table 1. Display of the attendances of lecturers and students

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Table 2. Information of grades entered by lecturer in the AIS module, ABC University Jakarta

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As displayed in Table 2 above, we see how the systems can deliver the services for the students' grades, when the lecturers do entry data of grades and submit in the systems directly the AIS application display them and each student can see his/her grades real time anywhere and everywhere as far as devices and internet connection available. There are many modules were available in the systems but there many of them still idle, so they need more and more trainings in order to optimize the systems. This system is a new ones which new technology that there is not available yet before
the year 2009 with the new and high technologies. The services are very helpful ones for all the students and management as well. In accordance with the idle module the management of the institution can hire or add staffs which have been familiar with this system in optimizing the idle ones. Then the management, stakeholders and also board trustees can use this application system to control and monitoring the activities especially in academic perspectives.

5 Conclusion

Recently regulations of the higher education institutions forces to do the good university governance. The reports of any university shall give periodically to the government and evaluated by the government officers from time to time. The evaluation has consequences to rank of the institutions and operationally licences for the future. This paper discusses about the usage of ICT in conducting the service delivery in higher education institution which used university ABC Jakarta as an empirical case study that can be used in other higher institution over all the country.

The service delivery by using information technology with high end standard is highly recommended in giving the real time service delivery to the stakeholders. The management of the institution suggests implementing the innovation strategy by using AIS application technology in providing the service to the students and lectures also other stakeholders. The results of this study in the paper, the researchers propose and recommend university ABC to optimize the idle module and sub-module in application in giving better service delivery to the stake holders. There are a lot of higher education institutions in the wide country still not yet use the dot net or web based technology application, that consequently making the unhappy students and late reports to the government, the other higher education institutions can adopt this system to manage the services delivery in their higher institutions.

References