

# **COMPUTER-BASED MANAGEMENT INFORMATION SYSTEM MODEL AT HIGHER EDUCATION INSTITUTION**

**[A Study of Model Development of Computer-Based Management  
Information System at Indonesia University of Education]**

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## **Abstract**

Globalization and decentralization have given impact to all systems including the situation for qualified decision making at Higher Education (HE) Institution, therefore data or information from management information system (MIS) that run well is required. For this purpose, there are several things required: 1) MIS that adaptive, dynamic, integrative, comprehensive and strategic in supporting the HE's development; 2) synchronize the demand of process and function of MIS in developing HE through the usage of available resources and infrastructures in accurate and realistic way; 3) synchronize the vision, mission, and values between all related parties are the power in building the continuity of process and function of MIS which are related to the availability and quality of hardware, software, brain ware, database, and working mechanism; 4) the management of synchronized process and function is the chosen alternative in optimizing the performance of MIS in HE; 5) the model of MIS required is the computer-based MIS in the wide networking system.

## **Background**

Various changes have affected all aspects in human life, including the existence of globalization has become one of the impacts of the development of information and communication technology (ICT), which make the organizational management has to reformulate its strategy, tactic, and target, because of the acquisition and usage of ICT will become a major important factor within an organization in facing global competition climate.

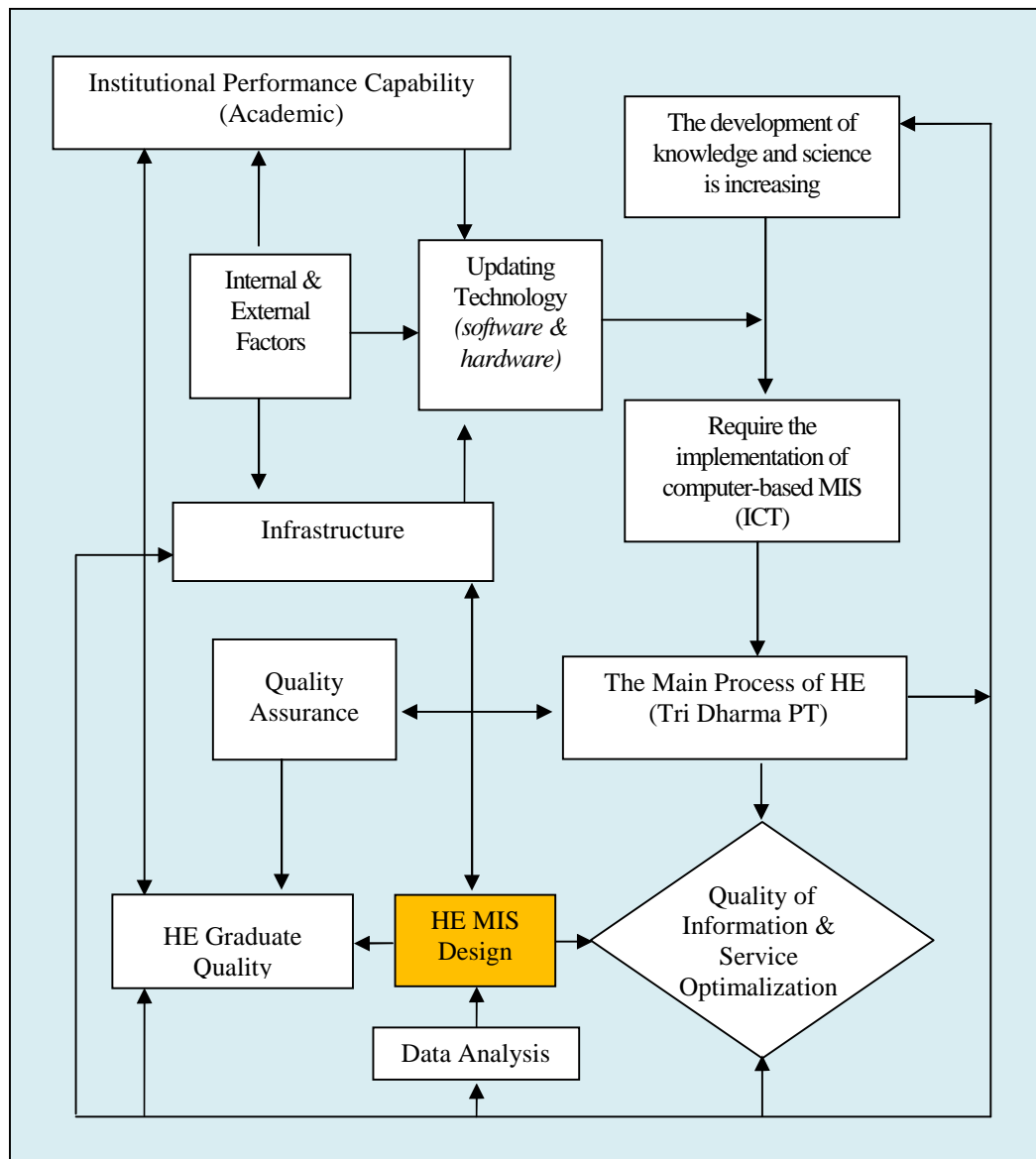
Professional MIS has a key role in succeeding an organization, which rely on the availability of information with quality (comprehensive, precise, accurate, objective, up to date, and relevant), which only could be acquired through right data management (systematic and practical), in order to support the organization effectivity, productivity, and efficiency. Another fact beside the ease of MIS, is the distance between facts and hopes of contribution that ICT could provide for management and vice versa, the facts of the perception differentiation between user and system analyst in producing and taking advantage of information. In turn, the decision maker faces to the uncertainty condition in decision making because of the wide gap between information produced and information needed by information users.

HE is one of formal social institution that has external and internal patterns of affecting educational process. Main function of HE directly and indirectly related to the society interest in terms of HE is one of society determination to the continuity of educational process. There is an admittance that HE recognized as international standard, is very expected by all HE not only in Indonesia, but also in many countries. The form of recognition is the Nobel, international accreditation, up to HE ranking based on certain indicators, which one of them is Webometric ranking that emphasizing to the availability and easiness of information access, how far the HE could be accessed through web, including the frequency of the web visited or accessed by public. In this respect, Indonesia University of Education (UPI) has entered 93<sup>rd</sup> rank and for Best Universities over the world is in the 3347<sup>th</sup> rank.

Problems related to the MIS in HE, could be focused on:

1. The availability of human capability that not be spread evenly, even it is not adequate enough in terms of quality and quantity, especially in managing and using information system with technology (computer) based.
2. Inadequate infrastructure to support the implementation of MIS with technology (computer) based.
3. The rapid development of knowledge and technology, causing HE has to follow the rapid changes and update both software and hardware technology which can support the implementation of MIS with technology (computer) based, while the HE capability to balance these changes is quite limited.

The general objective of this research is to find and to analyze the MIS in HE in operating its managerial task effectively and efficiently. The result of its analysis is formulated to become an alternative model of MIS at UPI. As the objective of this research is to make up a right model of MIS for the needs in HE, especially related to the function of MIS in terms planning, executing and evaluation, therefore the research framework of thinking in this HE MIS model development can be seen in the following pictures.



**Research Paradigm**  
**“Computer-Based Management Information System Model at Higher Education”**

### **The Development of Management Information System at Higher Education**

To find the chosen system and expected information, HE is facing the choices of policy between developed innovation and structural obstacle. In relation to the existence and the role of HE, the demand needs to be anticipated in order to increase the accountability of educational management. In this respect, since 2005, National Education Departement has set up a new policy for HE as the guidelines for planning program in order to develop education in Indonesia, both for HE that managed by the government (state owned HE or PTN) and HE that managed by the society (private owned HE or PTS). The new policy for HE including three main aspects, which are: (1) the equality and accessibility; (2) the

increased of quality, relevancy, and competitiveness; and (3) strengthening the management, accountability, and public brand image.

In relation to the quality development and competitiveness aspects, this requires HE to be able to run his tasks in developing knowledge and technology, curriculum and effective learning process. In terms of strengthening the management, accountability and public brand image, it is run through the development of operational law tools in order to develop HE to achieve the status of Badan Hukum Pendidikan Tinggi (BHPT), the autonomous and accountable HE, and non-profit institution. The management capacity development is also supported by ICT implementation, such as the development of MIS HE.

Triggered by the trends, the needs to develop HE to the excellent state in the globalization era, are based on several reasons:

- First, required changes in the world that changing rapidly is the speed of decision making with the restructuring solution. Restructuring means to resizing the bureaucracy chain in order to ensure that the steps are short, compact and in the right tracks.
- Second, the speed of executing changes through transformation solution. This is because of globalization that meaning of social transformation era, as mentioned by Drucker (2003). In order to work out with global competition, the strategic way is to develop education that has higher quality, including human resources, institution, supporting facilities, and other factors that has roles in educational process.

In other words, HE needs to respond any changes and ICT development rightly in order to ensure that HE becomes the centre of excellent for ICT application, therefore it is able to result in qualified graduates, ready to compete in this tight competition era. This condition has caused HE has always to adjust himself in the acceleration of changes of external conditions that because of ICT development.

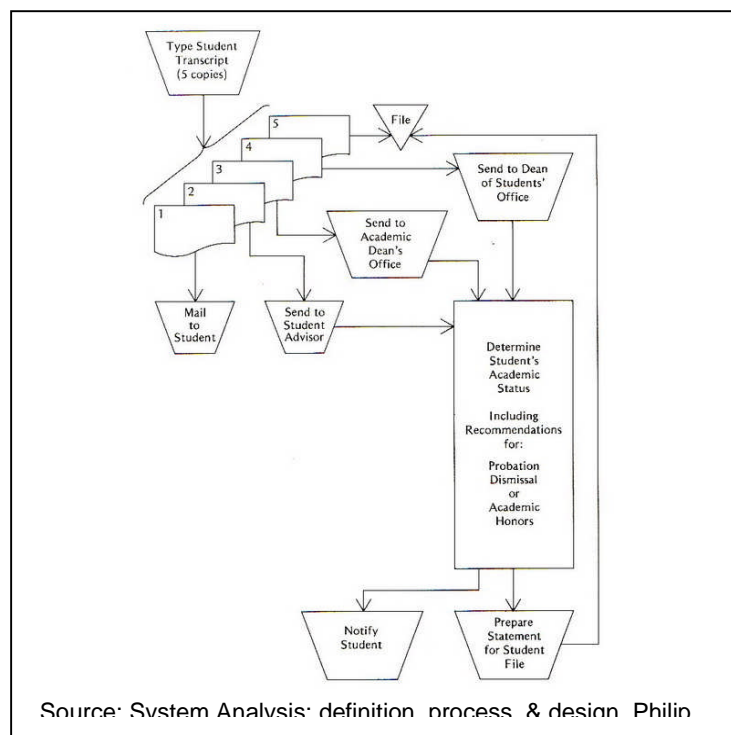
The involvement of ICT in the education world, based on Indrajit and Djokopranoto (2006), is the chosen choice that has become an absolute need that has to be owned and used by HE if HE wants to increase the quality of education. Creating society that based on knowledge as presented in the UNESCO mission has required the ICT implementation in its context. Spectrum and education world domain, especially HE, in the context of ICT development strategy in the education world, including four roles: increasing e-literacy society, decreasing the impact of digital gap, giving a birth of national competitiveness, becoming a centre of excellence. In relation to the main process and different ICT stakeholders, there are three ICT roles in HE (Indrajit and Djokopranoto, 2006): 1) ICT as *transaction and interaction enabler*, 2) related to the function of *front office*, ICT innovation to support the learning teaching process, 3) ICT as *performance information dashboard*.

One of ICT usage in HE is the concept of digital campus or *SMART Campus*, by the application of Student Identity Card with *Smartcard* technology based, Non-Cable Internet Access within Campus / *WiFi Hotspot*, Warnet Facility / Free

Internet Access, Digital Announcement Board with SMART PAGES (*Smart Paperless Announcement & Gallery Systems*), Electronic Presence Data System with RAIST (*Realtime Attendance Information System*), Tutorial System with Multimedia Based, Digital Library, *Academic Information System by Internet* (AISNET), *WAP for Academic Information System* (WAIS), *SMS for Academic Information System*, Information Terminal for serving the students' needs to access academic information independently.

### **Tentative Model for Management Information System at Higher Education**

Ideally, MIS in HE can provide qualified information and consider many other things such as the integrity of information to support the decision making process as follows:



### **The Example of Sub Unit Model of MIS HE**

The picture / model shows the information flow that can show the information integrity in HE, so data (for example about students) can be accessed by various interested parties. This ideal condition needs a plan through evaluation process on integrated, comprehensive, and strategic MIS. The above model is the picture that can become a reference for undergone research. In the implementation process, the development of plan, policy formulation, and the decision making of organization need support of qualified data and information. In this sense, there are needs for the preciseness, the accuracy, the comprehensiveness, the objectivity, and the relevancy.

### **Model Development Technique**

Model is perceived as the representation of the system, as the visualization or concrete construction of a concept that help in understanding and drawing reality.

The best model is the model that fulfills the validity and credibility criteria, which there are 3 steps to develop it, which are: (1) developing model with high validity phase; (2) testing model empirically and; (3) determining how to represent simulation data. Because of MIS model in this research is up to evaluation stage alternative model, therefore the writer only takes the first step.

The research about the development of MIS model at HE, is done at UPI campus Jalan Setiabudi Bandung. In this context, UPI is oriented to be capable HE institution in the field of teaching / education. Ideally, through UPI it is expected that the world of education will place a strategic position and managed by Indonesian nation himself.

Several things related to the research results as follows:

- The problem of managerial at UPI, including organizational structure that imply to the UPI MIS.
- The problem of service quality at UPI in relation to the satisfaction level of users and university performance.
- The behavior of civitas academia UPI toward the implementation of ICT.
- Main aspects that become the requirement to develop MIS at HE.

### **Conceptual Model of MIS for HE at UPI**

The evaluation result on the empiric condition including theoretical evaluation is enable to ensure that the system can be developed to run in optimal way, fit in with the need and condition. Looking at from structural aspects, MIS HE especially at UPI, ideally has fulfilled the requirements related to the integration of system in all levels of organization, both the leader level in relation to strategic decisions, managerial level in relation to coordination problems in vertical and horizontal way, including the operational level that need detailed information for executing the activities. The problems that may occur in this structural aspect in relation to the UPI organizational structure changes, that need adaptation process, while the demand of operational activities keep moving. Ideally, the MIS can accommodate various interests.

Looking at the componential information system, related to human resources aspect both for people who serve or users, one of the research shows that the user judges the quality of service provided by UPI, such as from academic activities, that not optimal enough, in relation to the information gathering process or academic information service generally, the availability of online media, through academic information system that can be accessed not only within campus area.

While for people who work in MIS, starting from system analyst to operator, the most important thing is the adequate human resources issue both in quality and quantity aspects. Therefore, the continuous training for human resources is needed in order to follow the technology changes not only for hardware that need upgraded, or software that need updates, but also brain ware aspect as the key factor to ensure the system runs in optimal way.

## Conclusion

Globalization and decentralization have impact on all system, including the quality of decision making situation at HE everywhere. As the logical consequences, there is a need of data or information from MIS that managed well.

MIS that adaptive, dynamic, integrative, comprehensive, and strategic, will create information with potential value in the development of HE. The manifestation of this management is computer based MIS at HE that has open system with flexible and dynamic program in selecting data from various resources that has variation system that result in solid information in order to fulfill the demand of users from different levels both internally and externally within the response of local and global wide, as the solution for MIS process and function.

The end conclusion from this research is as follows:

1. The concept of development policy of HE is based on quality orientation. Strategic approaches that taken by UPI in order to find solutions for internal and external problems in the UPI development, showing that UPI development using several partial change strategic (*incremental changes*) to ensure the balance of organization, not doing the whole changes (*radical change*) that transforming the whole institution. While the instrument of UPI development strategic is to use strategic plan management.
2. The education development at UPI uses educational resources in optimal way. The categorization of resources is human resources, infrastructure, financial resource, and academic.
3. Conceptual model for UPI development strategy summarize the following elements: (i) vision, mission, and objective UPI facing the issues and external challenges; (2) the strategic and development instruments; (3) the quality of UPI performance from the perspective of financial, customers, internal process, growth and learning; (4) capability profile of UPI graduates that has good academic performance, have roles and working attitude that relevant to the demand of ICT development; (5) quality profile of UPI educational system that including input, process, output, and its effect to the normative standards for BAN-PT accreditation and other quality agencies with national and international standards.

The UPI development plan changes tend to change the trend and the policy of organization (*radical change*) that enable UPI to be accountable as BHMN HE that *concern* with ICT area that needed for several reasons as follows:

- First, the more complex of governmental policy issue, the heavier external challenges, limited internal condition and ICT development that runs very fast that need to be anticipated creatively and in a smart way.
- Second, the government investment through UPI is quite huge but those are not proven yet satisfied both society, industry and government expectation, both in terms of the quantity and quality from the perspective of educational national standards.
- Third, strategic position in the capacity of PTN/BHMN that up to now is still needed by most of HE users.

Looking at the interest of UPI development, the implication of this research covering three aspects:

1. In institutional foundational level of UPI, there are core values that always being socialized to all UPI human resources. The *core values* that meant are the ones with quality orientation. The importance of socialization if because all those four *core values* are derivated from the side of the educational excellence vision at UPI with good MIS. Therefore the UPI development strategic will choose the cultural support from all human resources involved within.
2. In structural level, the development and the quality improvement as the continuous accountability of HE management that has to be a cognitive awareness and collective movement ability to all managerial levels and working units at UPI. In this way, the potential of different view between units in the line of achieving the development potential will be understood as the togetherness power to transform the educational resources to be processed and resulted in qualified and accountable states.
3. In operational level, the development strategy of UPI has to design the evaluation instruments to achieve the targets that enable the high quality performance, and the awareness to do *self evaluation* for all the performance for all human resources in all UPI units.

### **Recommendation**

From all empirical findings, discussion, and conceptual model that submitted for this case study, it can be recommended as follows:

1. Graduate qualification development is one of UPI HE product based on the capability mapping and relevant competency with the demand and the development of ICT. Therefore, the qualification and the competency of UPI graduates have to perform including intellectual competency, occupational competency, and cultural competency. Intellectual competency is related to the horizon and adaptive capability of graduate to the knowhow and the ICT development. Occupational competency is related to the graduates' capability in technology skills especially in the ICT. Cultural competency includes soft skill that are self capability, self awareness, value and working ethic that high adjustment with working ethics and corporate culture where the graduates work for.
2. The development strategic for UPI institution should be directed into two main quality issues. First is the quality of UPI performance that fulfill the requirements and quality indicators based on financial perspective, customers, internal process dynamic, the development of learning tradition and growth. This including the quality of HE system elements at UPI, including input, process, output, and outcome that has impact based on BAN-PT accreditation quality standards or from national and international quality institutions.
3. The choice of policy and development instrument for UPI should be based on the graduate capability profiles and the element of institutional quality that need to be achieved in the future. In this sense, comprehensive analysis and



the mapping of external and internal of UPI modalities are absolutely needed.

4. Other researchers have interest in understanding the theory of organization development in HE, resources management and HE quality that concern of ICT, is expected to be the start base of this research. Because of this research is the beggining effort and still with limited perspective view.
5. Quite interesting dimension from conceptual model of development stratety of HE that need to be developed for further research is to test the conceptual model to identify the strengths and the weaknesses of its elements to ensure that those can be tranferable for other HE like UPI.

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