

Multi-Campus Implementation of University Information Systems

Jaime DL. Caro

University of the Philippines Diliman
Quezon City, Philippines
jdlcaro@up.edu.ph

Rommel P. Feria

University of the Philippines Diliman
Quezon City, Philippines
rpferia@up.edu.ph

Ariel S. Betan

University of the Philippines Manila
Quezon City, Philippines
asbetan@up.edu.ph

Annette G. Lagman

University of the Philippines
Quezon City, Philippines
aglagman@up.edu.ph

Rowena C. Solamo

University of the Philippines Diliman
Quezon City, Philippines
rcsolamo@up.edu.ph

Paulo Noel G. Paje

University of the Philippines
Quezon City, Philippines
pgpaje@up.edu.ph

ABSTRACT

The e-UP Project is one of the flagship projects of the University of the Philippines Administration. It is based on a 5-year plan geared towards the design, development and implementation of a seamless and integrated University-wide Information and Communication (ICT) system. A key component of the project is the implementation of several key university information systems such as Student Academic information System (SAIS), Human Resource Information System (HRIS), Financial Management Information system (FMIS), Supplies Procurement and Campus Management Information System (SPCMIS), and Executive Information System (EIS). The implementation will provide an environment conducive to the quality performance of the University's core functions. It will address the ICT needs of students, faculty and administrative staff as well as enable the University to render efficient administration through the integration of constituent universities and interoperability of all systems through shared databases, online document management, and appropriate ICT infrastructure. This paper reviews the implementation methodology and discusses the issues and challenges faced, as well as the lessons learned in implementing so many information systems in a multi-campus university system.

Keywords

administration;information system;multi-campus;issues;database; university;integrated;integration;implementation;challenges;camp us management;document management;customization;off-the-shelf;focus group discussions;data;change management; in-house development;competency building;infrastructure;data warehouse; workshops;business intelligence;oracle;hardware;communication; financial analytics;software license;training;research;operational excellence;deployment;automation;public service;transparency; benchmarking; ICT audit;inventory; network;fiber optic; standardization; security;humanresources;software;hardware; upgrades;hotspots;communication;

1. RATIONALE

The pervasive use of Information and Communication Technology (ICT) in Philippine society is highlighted in the Philippine Digital Strategy (PDS) 2011-2016, which "recognizes that ICT increasingly permeates all parts of the economy and society, both globally as well as in our country. There is hardly a part of society and the economy that is not touched by ICT, either directly or indirectly. ICT is cross-cutting. ICT is an enabling tool" (Philippine Digital Strategy 2011-2015, p. ii). This view is echoed by the University of the Philippines through its ongoing eUP Project, wherein ICT will become the backbone for internal and inter-agency transactions.

The University is mandated by virtue of Republic Act 9500, also known as "An Act to Strengthen the University of the Philippines as a National University", to do the following:

- Perform its unique and distinctive leadership in higher education and development
- Lead in setting academic standards and initiating innovations in teaching, research, and faculty development
- Provide opportunities for training and learning in leadership
- Serve as a graduate university providing advanced studies
- Serve as a research university in various fields
- Lead as a public service university for the government, the private sector, and civil society
- Serve as a regional and global university in the Asia Pacific Region and around the world

For many years, the University has already been pursuing this mandate and continues to do so without a University System-wide ICT plan and without a responsible, permanent unit that will give focus to ICT policy directions and manage operations. In the past, ICT efforts in the University were done through a piecemeal

approach and designed only to address short-term requirements.

2. PROJECT OVERVIEW

It is out of these patchwork efforts that the eUP Project has emerged. The eUP Project is an ongoing endeavor of the entire University of the Philippines System with seven (7) Constituent Universities (CUs) and an independent college, located in different parts of the country. The envisioned eUP system shall be a platform that will integrate, harmonize, and interoperate ICT systems and infrastructure across all CUs. At this point, the project is deploying its systems in the pilot campuses and currently planning to actively deploy the systems in the remaining campuses as the second phase of the project.

Such a system will enable the University to greatly improve on the efficiency and output of its core functions: teaching, research, and public service. By using a single platform for its core operations upon which the CUs can seamlessly share resources and information online, eUP shall bring the University to new levels of academic and operational excellence. This, in turn, will allow the UP community as a whole to be of greater service not only to the University, but also to the nation.

Furthermore, the project is in line with the Philippine Development Plan (PDP) 2011-2016 in that it promotes the “automation and computerization of government processes... to reduce transaction costs and make public service more efficient” (p.83). These systems, once they are developed, deployed and fully utilized, will improve the efficiency of the University’s processes throughout the CUs and promote transparency and accountability.

In the long-term, the success of eUP will lead to the establishment of common standards, harmonized systems, and shared services across constituent units with decentralized transaction processes—a situation that is ideal for operational efficiency that will support the University’s continuing tradition of academic excellence. This is also in accordance with one of the sub-goals in the PDP 2011-2016 that “the government shall pursue innovation as an essential factor in harnessing culture of competitiveness” (p.84) and it is hoped that this will help bring the University to the level of top notch Universities in Asia and even worldwide.

More so, it will contribute to the PDP 2011-2016 in that it will “promote a culture of multi-disciplinary collaboration, knowledge sharing, open dialogue and cross fertilization of ideas” (p.84). This in turn, will support one of the Key Result Areas (KRAs) in the Social Contract with the Filipino People (Executive Order No. 43, s. 2011), namely the achievement of “transparent, accountable, and participatory governance.” The information systems and other components of the project will contribute to an “institutionalize open, transparent, accountable, and inclusive governance” via ICT.

3. PROJECT COMPONENTS

To achieve the eUP’s main goal, there are preparatory components that are being implemented: policy formulation, organization and mobilization, benchmarking and ICT audit. In addition, three key areas will be emphasized and strengthened: Information Systems Development and Deployment, IT Infrastructure Upgrade, and IT Capability Building. These key

areas will address the disparities that exist between the University’s current situation and the eUP vision. They are detailed as thus:

A. Policy formulation, organization and mobilization

The project includes formulation of system-wide policies and standards on data security, data privacy, and ICT resources acquisition and utilization. A university-wide ICT organization will also be created, to manage the operations of the centralized university information systems, as well as the supporting infrastructure.

B. Benchmarking and ICT audit

Benchmarking for hardware, software, manpower, data and, connectivity will be an ongoing activity in order to keep the Core Technical team informed and adjust the project as needed to best cater to the needs of the University. This means looking at approaches in selected top universities around the world for the identification of best practices and best implementation models for the identification of any additional systems to be standardized, systems to be developed, and systems to be procured.

C. Acquisition or development and installation of appropriate information systems

Five major information systems will be acquired as off-the-shelf products with minimal customization. Student Academic Information System (SAIS), Human Resources Information System (HRIS), Financial Management and Information System (FMIS), Supplies, Procurement, and Campus Management Information System (SPCMIS), and Executive Information System (EIS) make up the eUP Core Information Systems. The remaining information systems, on the other hand, will be developed in-house by the software development team. The Information Systems section of this paper will discuss this component in detail.

D. Infrastructure Development

Upgrading of ICT infrastructure requires major investment in hardware, communication systems, and interconnection among campuses. Connectivity development covers intranet/internet connectivity, premises wiring, intercampus connections, and Wi-Fi hotspots around UP campuses. Integrated communications system are made possible through VOIP, Video Conferencing, and multimedia broadcasting. Hardware and software acquisition will be a priority along with the implementation of a university-wide security infrastructure and security systems in selected areas.

E. ICT Competency Building

ICT competency building shall include upgrading of IT

knowledge base, faculty, REPs and administrative staff development, skills development for students, and strengthening partnerships and upgrading competencies for government, and industry partners.

Ultimately, the combined success of each component in this phase of eUP will lead to the establishment of common standards, harmonized systems, and shared services across constituent units with decentralized execution—a situation that is ideal for operational efficiency that will support the University’s continuing tradition of academic excellence.

4. THE INFORMATION SYSTEMS

The University takes two paths when it comes to the information systems it will use. One path is the utilization and development of homegrown systems. The other is the acquisition of systems to be fine-tuned to its needs for its core functions. Figure 1 shows the University’s System Integrated Architecture.

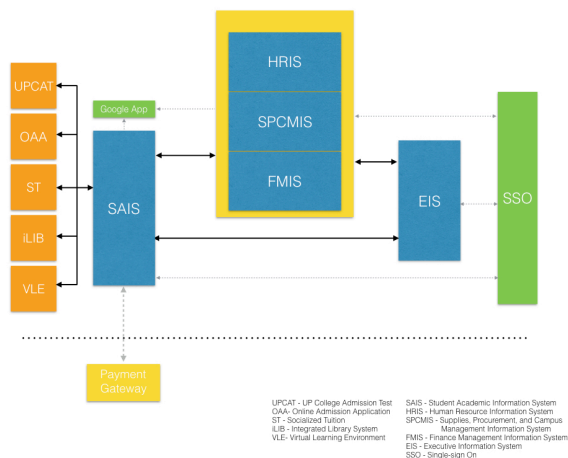


Figure 1. University’s System Integrated Architecture

eUP core information systems

Five core information systems will be installed to support vital University functions such as student registration, University administration, and funds allocation to name a few. These systems are:

- Student Academic Information System (SAIS). It is capable of obtaining, processing, retrieving, updating and displaying student, faculty, and alumni information. It covers most aspect of running a large multi-campus institution such as UP. Its primary function is the management of student-relevant data needs.
- Human Resources Information System (HRIS). It enhances the HR processes such as management of employee profiles, attendance, benefits, leaves credits and evaluation records, computation of compensation, performance monitoring and reports generation.
- Financial Management Information System (FMIS). It consolidates all financial information generated and used by accounting, budget and offices across all CUs.

- Supplies, Procurement, and Campus Management Information System (SPCMIS). It automates processes related to the procurement of goods and services including inventory.
- Executive Information System (EIS). It consolidates information from the systems to meet the University’s strategic goals. At a glance, University administrators can view accurate information in real-time. This enhances the University’s delivery of its core services and fortifies its decision-making capabilities.

Guided by the Terms of Reference (TOR), the Core Information Systems were bid out and awarded to a joint venture that includes several partner companies, with a total amount of Php 134,618,243.88, already inclusive of VAT. The TOR includes provisions for the following in support of the core systems:

- Perpetual software licenses for the SAIS, HRIS, FMIS, SPCMIS and EIS
- Software licenses of supporting applications, as needed
- One year maintenance support
- Project management and implementation, as well as training of users and UP technical personnel involved in SAIS implementation in UP Manila and UP Open University
- HRIS implementation in UP Manila, UP Open University, and UP Diliman (including UP System offices)
- FMIS implementation in UP Manila, UP Open University, and in UP System Offices
- Project management and implementation of business intelligence software and its integration with SAIS, HRIS, and FMIS for use in UP System offices as well as in UP Manila and UP Open University
- Hosting services including installation in data center as well as SLA (service level agreement)
- Overall project management and systems integration
- Technical training on Systems Administration, database administration, and software for SAIS, FMIS, HRIS, and SPCMIS.

The University purchased perpetual licenses for the following which would be used in all campuses of all constituent universities of the UP System:

1. PeopleSoft Enterprise Gradebook
2. Oracle Inventory Management
3. User Productivity Kit Professional
4. Financial Analytics Fusion Edition
5. Procurement and Spend Analytics Fusion
6. PeopleSoft Enterprise Contributor Relations
7. Oracle Human Resources - Employee
8. PeopleSoft Enterprise Fusion Campus
9. Intelligence for PeopleSoft Enterprise
10. Oracle Project Billing for Oracle Project Costing
11. PeopleSoft Enterprise Student Administration Integration Pack
12. Oracle iProcurement
13. Oracle Payroll
14. Human Resources Analytics Fusion Edition
15. User Productivity Kit Professional Developer
16. Oracle Grants
17. Informatica PowerCenter and PowerConnect Adapters

18. Identity and Access Management Suite Plus
19. PeopleSoft Enterprise Campus Solutions Warehouse
20. Oracle Learning Management
21. PeopleSoft Enterprise Campus Self Service
22. Oracle Performance Management
23. Oracle Self-Service Human Resources
24. Oracle Database Enterprise Edition
25. Identity and Access Management Suite Plus
26. Oracle Internet Expenses - Expense Reports
27. Oracle Purchasing
28. Oracle Financials
29. PeopleSoft Enterprise Student Administration
30. Oracle Time and Labor
31. Oracle Project Costing
32. Oracle Business Intelligence Suite Enterprise Edition Plus

In-house information systems

Homegrown information systems are utilized and integrated to the core information systems. They are:

- UP College Admission Test (UPCAT)
- Online Admissions Application (OAA)
- Socialized Tuition (ST)
- Integrated Library System (iLIB)
- Virtual Learning Environment (VLE)

Other systems that will be customized or built upon free and open source software are:

- Content Management System and Information Portal for the Office of the Secretary of the University (OSU)
- Management Information System (MIS) and InfoSite for the Office of Scholarships and Student Services (OSSS)
- Online Internal Academic Assessment and Development System (iAADS) – *a system-wide online survey from the Office of the Vice President for Academic Affairs (OVPA)*
- UP Internationalization Program – *MIS and InfoSite for the Office of Institutional Linkages (OIL)*
- Faculty Regent Election System
- Legal, Case, and Issue Management Information System
- Intellectual Property and Business Development Information System
- Medical Records and Hospital Information System, mainly for the Philippine General Hospital
- Learning Management System
- Document Tracking System
- Project Management System

Key characteristic of these information systems are that they are integrated and synergized systems that will share and exchange information. These integrated systems will be accessible in every campus through the Internet. In turn, campuses can easily exchange information since there is a common platform. Having a common platform also means that it will be easier to compile and generate the information needed per campus up to the system-level. This means less manual work in compiling and double-checking university statistics, faster consolidation, and updated and reliable information.

5. THE PROJECT IMPLEMENTATION

By the end of this 5-year period, the University has fully utilized ICT in all aspects of its operations supporting teaching, research and public service. The University will achieve a high degree of efficiency and productivity as it continues to carry out its mandate of delivering quality education and fulfill its commitment to national development.

It is envisioned that the e-UP plan will serve as an active framework that can give ICT direction to all members of the UP community for the next 5 years and actualize the President’s vision laid out in “Tatak Pascual: Redesigning the Face of UP to the World”. This plan recognizes the role of every sector of the University in achieving success and the degree of their participation will be the measure of achievement towards the goal of turning the University of the Philippines into a modern university and a digital institution that is truly responsive to the needs of the Filipino people.

Phase 1 of the eUP Project being implemented by the winning bidder joint venture and partners. They are also expected to provide the necessary training to the eUP Team on implementing the integrated systems for Phases 2 and 3.

Table 1. The following plots which information system will be implemented per phase per CU based on the initial plan

Phase 1	SAIS	FMIS/SPCMIS	HRIS	EIS
UP Manila	•	•	•	•
UP Open University	•	•	•	•
UP Diliman	--	•	•	•
UP System Offices	--	•	•	•
Phase 2	SAIS	FMIS/SPCMIS	HRIS	EIS
UP Los Banos	•	•	•	•
UP Baguio	•	•	•	•
Phase 3	SAIS	FMIS/SPCMIS	HRIS	EIS
UP Visayas	•	•	•	•
UP Mindanao	•	•	•	•
UP Cebu	•	•	•	•
UP Diliman	•	--	--	--

Table 2. Joint venture and its partners prepared this project timetable to serve as the implementation guide for the project.

		enrollment. UP Manila - The plan is to launch the system in time for summer enrollment. The SAIS team will be conducting the End Users' Training starting next week for the different users in preparation for go-live.
Human Resource Information System (HRIS)	All employees	STATUS: Live System - currently limited to HR Offices of all CUs and System-level. Roll-out of Self-service Module for all employees to be determined by CU. BENEFITS & IMPACT: With the Batch 1 modules, this will enable the online updating of personnel records and online submission of the following: limited practice, publications, feedback, and SALN.
Financial Management Information System (FMIS) and Supplies, Procurement & Campus Management Information System (SPCMIS)	All employees of the Accounting, Budget, and Cash (ABC's) Offices of all Constituent Universities and at the System-level All employees of Procurement and Campus Management Offices	STATUS: Pending Go-Live (targeting 1st Quarter 2014) for CUs BENEFITS & IMPACT: Upon go-live, the modules related to disbursement voucher transactions and processes, performance of day-to-day accounts receivable operations, functions pertaining to fixed assets, general ledger, cash management, as well as management of projects and grants. For SPCMIS, the the three modules: iProcurement, Purchasing, and Inventory will be available. These modules will aid in ordering good and services from supplies, process purchase requests, approval of quotations, purchase orders, and will ultimately aid the University make well-informed, inventory-related decisions by minimizing stock and maximizing cash flow.
Executive Information	UP President, Vice Presidents,	STATUS: Pending Go-Live in 2014 for all CUs

System (EIS)	Assistant Vice Presidents, Chancellors, Vice Chancellors, Deans & Heads of Units, Department Chairs	BENEFITS & IMPACT: Provide updated and consolidated reports required by the officials at their level for decision making and other administrative purposes.
--------------	---	--

The following outlines some of the challenges and risks faced in implementing the project, together with some mitigation strategies.

Table 4. Risks and Mitigation Strategy

Risks	Mitigation Strategy
CUs resist in changing the existing processes since it is their tradition	Propose more efficient processes compared to the existing processes to convince stakeholders
Rapid increase of the different tasks and changes during the development of the project	Conduct time and motion study
Problem in having a difficulty in standardization of process, etc.	More research and analysis must be conducted Stakeholder consultation on standardization of processes
Lack of interest from the personnel involved	Conduct Consultation Workshops and Regular Meetings Give incentive for participation in the project
Neglecting the importance of the risk analysis	Conduct a general Planning and Risk Analysis Workshop Monitor, mitigate and address risks
Increasing number of hackers and standard of security and privacy	Hire/Train protocol, policies and computer security specialists
Stakeholders resist to accept and understand the proposed system	Conduct regular consultations Involve stakeholders in all phases of the project
Disregarding the importance of the schedule, numerous changes in the project, and periods are not strictly followed.	Emphasize the given schedule and strictly monitor the progress of the different tasks.
A System Integrated Plan is not well-defined and followed.	Ensure buy-in of the Project Plan by involving all stakeholder groups in planning Communicate the plan to other stakeholders.

	Regular meeting for communication and coordination of project activities that are interrelated Track project progress and changes against the plan.
Difficulty in applying and managing software versions and patches to the systems	Minimize customization of off-the-shelf systems Track updates and patches installed Use configuration management tools
Fast turnover of personnel from both implementer (who were replaced by less experienced individuals) and university sides.	Equip university personnel with knowledge through training Buddy-buddy system in place within teams Communicate plans and activities through weekly meetings Provide sessions for technical discussions (such as Tech Tuesday)
Knowledge transfer was inadequate.	Equip university personnel with knowledge through training Assign more activities to University personnel to gain more experience Provide sessions for technical discussions (such as Tech Tuesday)
The Quality Assurance's role in the implementation was not given enough attention.	Communicate the importance of quality assurance in the implementation of the project Establish coordination among IS Team with QA Team Assign a QA member to each IS team

The following are some of the lessons learned from the project implementation

- Minimize customization of off-the-shelf systems
- Streamline processes to conform to best practices
- Allocate full-time non-IT staff for functional areas of the eUP Project
- Ensure executive support

- Explore the use of Free and Open Source Software (FOSS)
- Promote information exchange between CU Teams on eUP matters including implementation issues
- Ensure sustainability and scalability of the eUP Project
- Develop technical expertise at each level
- Focus on change management to ensure buy-in of all stakeholders

ACKNOWLEDGEMENT

We thank Sarah “Joy” Salvio, Rafaela Anne Rivera, Nadira Abubakkar, and Richmon Pancho for the project documentation. Much of the result in this paper are also attributable to the other eUP project leaders, namely Jhie Respino, Cherie Ann Pasco, Vincent Teodosio, Stephen Ko, Hernando Salapare, Dante Vergara, Natividad Formoso, and Carlos Forteza. We also acknowledge the leadership of Elvira Zamora, Vice President for Development, who served as the first Project Director. Finally, we thank Alfredo E. Pascual, President and project sponsor, for his unwavering support, encouragement and guidance.

REFERENCES

- [1] Philippine Digital Strategy 2011-2015, p. ii
- [2] "Chief Information Officer - CIO Job Description". eJobDescription.com. <http://www.ejobdescription.com/CIO_Job_Description.html>
- [3] Final Diagnostic Report – Complete Version". April 2010. <<http://oe.berkeley.edu/about/index.shtml>>
- [4] Pascual, Alfredo. “Remaking A Great University: UP in the 21st Century. A Vision Statement for the University of the Philippines.” August 2010.
- [5] "Project Procurement Management". ITworld.com. <<http://www.itworld2.com/pmpprocure.aspx>>
- [6] University of California, Bain & Berkley. "Achieving Operational Excellence at University of California, Berkeley.
- [7] "University of Virginia Information Technology Security Risk Management (ITS-RM) Program". Version 3.0 Revised August 3, 2010.
- [8] Nash, C. (2000). Guidelines in Choosing a System Integrator. *Information Management from the Auerbach Information Management Services Archives*. Retrieved, February 21, 2016, from <http://www.ittoday.info>