Our Lady Of Lourdes College Foundation

Student Consultants: Jeremy Cohen Hoffing, Melissa Acosta
Development Partner: Gerry Lopez

I. Background Information

Our Lady of Lourdes College Foundation (OLLCF) is an ever-expanding educational institution with the goal of furthering the development of capabilities for the Filipino youth and community.

MISSION: "Our Lady of Lourdes College Foundation, as an institution of higher learning is dedicated to the pursuit of Knowledge, Truth and Wisdom through the Guidance of Divine Providence as it seeks the total development and formation of the Filipino Youth."

VISION: "Empowering its students with human, conceptual and technical skills so that they best develop themselves and be instruments in bringing about a GOOD and FRUITFUL LIFE FOR ALL."

It was founded by a passionate visionary patriot, Dr. Abundio P. Palencia, to develop the capabilities of the Filipino community in order to become competitive in the global arena. Today, the mission is carried out by a community led by the founder's equally passionate children serving as the board of trustees. The college seeks to concentrate on the development of technological capabilities in computing, communication, agriculture, and health care.

- Taken from TCinGC 2009 team

II. Consulting Tasks

The TCinGC 2011 team had three major tasks for OLLCF, two of which I worked on. The first task was to network all the computers inside the school's main building. The second task was to create a computerized student record system, which would increase the efficiency of several administrative processes, and create a consolidated student information database with controlled access for faculty and employees.

Creating the school network was straightforward. I first researched various materials and equipment that would be needed for such a task and then placed orders for the equipment. I assigned several of the school's technicians the duty of installing the network and oversaw their progress throughout the project.

To implement the student record system, I first evaluated the current information flow of OLLCF by interviewing the primary offices that interact with student information on a daily basis. This included meetings with the registrar's office, accounting office, and the dean of Computer Studies to know what current resources the offices used, all critical procedures the office is responsible for, how procedures relating to student information are currently run, any problems they have had in the past, any suggestions there are for new procedures (if any), and which faculty and employees are able to assist me.

Once I had the appropriate background knowledge, I moved onto researching different distributed system technologies that would be customizable to include the features and procedures needed by the various offices. I kept in mind several factors, such as the resources at my disposal, the financial status of the school, the capability of the technical staff at OLLCF, the capabilities of myself, and the limited time I had.

After struggling to develop two various information systems, I refocused my efforts and collaborated on a new project with computer studies teacher Dario Galeon. Together we created a PHP web application customized to the needs of the various offices that would be using it. I met several times with the registrar office to get their feedback, since they would be interacting the most with the system. My goal during this time was to have all critical features implemented, and then train the users of the system.

Once I finished as much customizations as I could, I began to work with the registrar's office to train and get feedback on last minute changes that need to be made with the system. Preferably, I would have liked to have more time to get feedback, but delays in system development and installation of the local network prevented me. During this time, I created user guides, a data dictionary and a To-Do list of incomplete functionalities and other tasks that still need to be tended to.

III. Outcomes Analysis and Recommendations

Task 1: Network the main building

Results – A 16-port switch and 4-port wireless router were purchased along with CAT5 Ethernet cables to create the network. The final network that was installed includes the registrar, accounting and presidents' office. The computer studies office on the first floor and the deans and teachers' offices on the second floor are still not connected to the network. This should be a priority for the technicians at OLLCF or future TCinGC student consultants.

Risks – One risk is that the student record system cannot be fully utilized if the deans remained disconnected from the network and the web application. Furthermore, the network may stop working if not maintained properly by staff.

Task 2: Streamlining the Enrollment Process

Results - The system I built allows different access levels, and simultaneous access of information for administrators, deans, registrar, accounting, teachers, and student assistants. Depending on the user's access level, the users will be able to view and edit specific information. The system will make the enrollment process more efficient because student information only needs to be recorded once. Faculty can then search the student database and retrieve student information immediately.

Risks - One risk to customizing the system is that errors may arise as changes are made. If there are undiscovered bugs in the future, the Computer Studies department will be held responsible for solving problems with the system.

Our Lady Of Lourdes College Foundation
Final Consulting Report

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I. Overview

Organization

Our Lady of Lourdes College Foundation (OLLCF) is an educational institution located in Daet, Camarinas Nortes in the Philippines. OLLCF has the goal of furthering the development of capabilities of the Filipino youth and community. The client approached the technology consultants from the Technology Consulting in the Global Community (TCinGC for a sustainable and integrated solution to organize, maintain and develop their student records system. During the organizational assessment stage, our team's objective was to determine the structure and environment of OLLCF, to find ways in which the student records management can be improved through a digitized, online system.

We created this objective because our initial purpose was to become familiar with the college structure and assess the most feasible and immediate needs of the college. Since our team will be in the Philippines for the duration of ten weeks, we wanted to make sure we are able to research, implement and test our solution in the given time frame. Our research and inquiries were directed towards understanding the current structure and flow of the student records management system, its strengths and weaknesses.

II. About the Organization

About OLLCF

OLLCF was founded by a passionate visionary patriot, Dr. Abundio P. Palencia, Sr., to develop the capabilities of the Filipino community in order to become competitive in the global arena. Today, the mission is carried out by a community led by the founder's equally passionate children serving as the board of trustees. The college seeks to concentrate on the development of technological capabilities in computing, communication, agriculture, and health care.

MISSION: "Our Lady of Lourdes College Foundation, as an institution of higher learning is dedicated to the pursuit of Knowledge, Truth and Wisdom through the Guidance of Divine Providence as it seeks the total development and formation of the Filipino Youth."

VISION: "Empowering its students with human, conceptual and technical skills so that they best develop themselves and be instruments in bringing about a GOOD and FRUITFUL LIFE FOR ALL."

Facilities

The OLLCF campus has a main building with classrooms, deans and administrative offices. Inside the building are three computer labs and an audio and visual room. The campus also has a building for the elementary and high school, as well as a canteen, outdoor gym and field for sports.

Programs

Basic Education

Under the basic education school there are the preschool (2 faculty members) and high school (12 faculty members) departments. The high school has a particular emphasis on general sciences and computer skills.

College

OLLCF has nine colleges, each having its own structure consisting of a dean, administrative staff and a teaching faculty. The colleges and degrees they offer are:

- College of Arts and Sciences (14 faculty members)
- Bachelor of Science in Psychology
- Bachelor of Arts major in Psychology and Economics
- College of Physical Therapy (4 faculty members)
- College of Computer Studies (7 faculty members)
- Bachelor of Science in Computer Science
- Associate in Animation
- Certificate in Computer Secretarial
- Certificate in Computer Programming
- College of Criminal Justice Education (8 faculty members)
- Bachelor of Science in Criminology
- College of Education (6 faculty members)
- Bachelor of Science in Secondary Education
- Bachelor of Science in Elementary Education
- College of Business Administration (7 faculty members)
- Bachelor of Science in Office Administration
- Ladderized BS in Hotel & Restaurant Management
- Bachelor of Science in Tourism
- College of Maritime Studies (5 faculty members)
- Bachelor of Science in Marine Engineering
- Bachelor of Science in Marine Transportation
- Certificate in Welding Technology
- College of Nursing (40 faculty members)
- Bachelor of Science in Nursing

- Certificate in Midwifery
- Certificate in Health Care Services
- College of Medical Technology (2 faculty members)
- Bachelor of Science in Medical Technology
- Bachelor of Science in Radiologic Technology
- College of Engineering (1 faculty member)
- Bachelor of Science in Computer Engineering
- Bachelor of Science in Electronics and Communication Engineering
- College of Communications (2 faculty members)
- Bachelor of Arts in Communication

The college is also undergoing accreditation to become a university, which requires three levels of standardization based on Commission of Higher Education (CHED) regulations. Currently there are three colleges accredited at level one: College of Business Administration, College of Education, College of Nursing, and. OLLCF is in the process of advancing from level one up to level three by means of increasing its current capabilities and incorporating a strong research component. The high school has also completed its requirements to reach level one. After three colleges reach level three, the institution can apply to become a university. Once a university has at least five colleges that are Centers for Excellence, it can apply to become an autonomous entity able to develop its own requirements independent of CHED. Once the university becomes autonomous, its high school can similarly gain that status after reaching level three, freeing it from the requirements of the Department of Education. In addition, there exist partnerships with the Philippine Women's University and the University of the Philippines Open University for graduate, doctoral, and additional certificate programs.

-excerpt from TCinGC's 2010 report

Computer Studies Program

- The Computer Studies program contains six divisions. Those divisions are:
- Bachelor in Computer Science
- Ladd. Bachelor of Science in Computer Science
- Computer Programming's NCII (2 year program)
- Robotics
- Animation

The college of Computer Studies contains a dean, teachers, technicians, and laboratory custodians. In total there are 12 faculty members within the college of Computer Studies. The animation department is also within the Computer Studies college. They use software such as Maya, Blender, Google sketch up, Photoshop and Flash. The college of Computer Studies has classes like Software Engineering, Database design, Information Systems management, Animation, Programming and Data Structures. They have used programming languages and software such as C, C++, Java, PHP, Visual

Basic and Microsoft Studio Environment. Robotics is offered only as a class for 4th year computer science students as an elective.

Staff

Administrative Affairs

Janet D. Kho is the Vice President of Administrative Affairs, and is our main go-to person for any logistical questions.

Technical Assistance

Gerry Lopez is the dean of College of Computer Studies and has a Masters Degree in Computer Science. He is the person we go to for help in arranging meetings with the OLLCF administration, and for any technical assistance we may need. He is committed to working with us until the completion of our project, and has assigned Darius Galeon to work with us and maintain the results of our project once we leave the Philippines.

Darius Galeon is a Computer Studies teacher and will be assisting us throughout the entire duration of the project. This will reduce the amount of training required as he learns about the entire system from creation to completion.

We will be working with the staff in the Registrar and Accounting office. Both offices are in charge of the enrollment and billing process of each student. We will need their expertise to understand the daily workflow and problems they are facing.

Registrar

Helen T. Valenzuela, Head of Registrar: Helen ensures the work quality in the registrar office, assists in the evaluation of students, coordinates with the deans and department heads, report to the VP of Administrative Affairs and the VP of Academic Affairs, formulates office procedures, encode student data and oversees the filing and recording of student records. She is working closely with us to ensure that our solution will meet their needs.

Ailen D. Guinto, Records officer. She works closely with the Head of Registrar in the filing of reports to CHED, the Commission of Higher Education. She creates the census of enrollment, records for graduation and records students' grades. Along with all of the staff members, she shares duties in filing, recording and assisting students.

Melany Carillo, Transcript of Records officer. Melany is assists graduates and transfer students. She creates records of Good Moral Character and processes student credentials. Along with all of the staff members, she shares duties in filing, recording and assisting students.

Lira Tabuzo, Clerk. Lira creates student credentials of Good Moral Character, grades and honorable dismissal. She also processes the CHED Authentication Verification reports and assists with the general filing and enrollment of students.

Technology Infrastructure

Computer Labs

The school currently has three computer labs, an “internet lab”, computer lab and library lab. The labs are all locally networked but the internet lab is the only computer network with a reliable internet connection (although it is extremely slow). Computer Science students and faculty are the only ones designated to use the internet lab for research purposes. Other faculty, students and staff are not allowed to use it for entertainment purposes and a lab assistant is there to enforce this rule. Furthermore, the host files on each computer are edited to block certain websites.

The computers use the Windows Vista operating system with Microsoft Office for document management, Excel and Powerpoint. The AVG free edition and Avira programs are used for virus protection.

If computer hardware fails, the computer has to be taken to Manila where there is more expertise, repair facilities and supplies. This is an 8-10 hour bus ride away so computers will be out of commission for several days.

Internet Access Points and Wired Connections

There are several access points at the school and one access point at the hospital. One access point is located in the Internet lab, which also has a wired connection. The president’s office contains another wireless access point as well as a single DSL line connecting one desktop computer. The wireless router gives wireless Internet access to certain areas within range on the first floor. All of the wireless access points have been reliable although occasional power failures knock out the Internet connection.

Internet Service Providers

The school currently has four different existing internet lines through four different internet companies: Bayantel, Smart, Digitech and Calaguas. Bayantel provides two separate 1 Mbps DSL lines, one to the high school and one to the internet lab. Smart provides a satellite connection to the wireless access point in the president’s office. The plan claims to have a 2Mbps connection but the speeds are far slower than that. The fourth line is the single DSL line running to a single desktop computer in the president’s office. There is no particular reason for having four separate Internet Service Providers. It seems it was accidental, either as a result of miscommunication or the fact that Internet was installed without consultation and on an as-needed basis. It is our plan to reduce the ISPs to a single provider and upgrade the lines with a faster connection. This will significantly reduce monthly fees and improve overall Internet speeds.

Computers for Office Use

Each academic office has at least one computer. Several school administrators and Computer Science faculty have personal laptops.

The Registrar’s office has four computers, three working and one non-functional. Helen T. Valenzuela, the head of the Registrar’s office uses one computer for administrative tasks as well as registrar processes such as entering data into Excel. Two office assistants use the other two computers. They input student information into Excel spreadsheets and create special reports with the data. The computers are all networked with a 5-port hub but there is no Internet access.

The Accounting office also has four computers with no Internet connection, one of which is non-functional, and another has a broken USB port. The second computer is used for payroll and assessments, but because the staff stores their data on thumb

drives, they must schedule times to share the computer with the working USB port. The fourth computer is strictly used for the cashier to manage payments.

Technical Management

Rommel Patorito and Edmar Norte are both the computer technicians for OLLCF. They are in charge of maintaining the computers, laboratories and networks, including upgrades, repairs and software installations. The OLLCF Administration must approve any decisions made by them.

Gerry Lopez, the current Dean of Computer Studies, is our primary contact to answer any technology-related or administrative questions. He will also be helping us determine the scope of our project in similar fashion to last year's TCinGC team.

Technology Planning

Gerry Lopez created the five-year development plan, from 2009 to 2014 in regards to improving the technology infrastructure. The overall goal of the plan is to elevate the college to university status, according to CHED, the Commission of Higher Education, standards. The VP of Administration Affairs approved this plan and Gerry and his staff has been working to implement the following goals:

1. Establish a Multimedia Room
2. Computerize all school systems
3. Create an integrated system
4. Create a general server to allow the Computer Science Department to monitor these computerized systems.
5. Improve Internet Speed and Compus-wide WiFi

There are two existing systems being used at the college, all of which were created using Visual Basic by Gerry and his department staff:

Library System: Gerry and his staff created a library borrowing system for the library staff. Staff can record borrower information, retrieve the borrower's history and add to the borrower record. This system was created with Visual Basic and is currently being used in the library computers.

Guidance System: This system allows the guidance officer to record and retrieve student information. The system also allows the officer to generate student evaluations. The system is currently being used in the guidance office.

The IT staff is currently developing the following systems:

Payroll System: There also exists a payroll system that allows employees to automatically check in/out, and allows the accounting staff to monitor employee salaries. The accounting department is currently testing this system. Gerry will present this system for approval a month after the date of this report.

ID Attendance System: A system composed of student barcodes, in which the students will scan their ID cards upon arrival to the school and the system will automatically generate a text message to the parents to inform them that their child arrived in school.

Registration System: A system that allows the registrar staff to store and retrieve student records and allows them to generate reports. During the testing phase, the staff encountered program errors that are currently being addressed. As student consultants working on improving the registration process, we are looking aid in the development of this system.

Grading system: The system allows the faculty to store student grades. Students can also send a text message to the school (with the ID#, year and course) and the system will automatically text reply with a list of their semester's grades. This system was created and will soon be tested by the faculty and students.

Automated Yearbook: A system where the system administrator uploads student pictures online and the system generates a yearbook template with all of the pictures.

Internal Communication

The communications between the different departments of the school are mostly through face-to-face meetings, or letters delivered to the different offices. Messages that must reach a large audience are posted on bulletin boards or doors of the office or department's main office. Because many of the offices do not have computers with access to the internet, virtual communication (such as email, or instant messenger) is not used often.

External Communication

OLLCF external communications mostly involves the OLLCF administration. The registrar staff submits here submits reports to the CHED (Commission of Higher Education) as a means to further their goal to becoming a University-level institution. General administration and department heads have also involved OLLCF in several international and nation-wide events, such as the Robotex event (Robotics exhibition that Philippines colleges participate in) and the Bagasbas International Eco-Arts Festival. These have helped to further OLLCF's goal to become an internationally recognized institution.

OLLCF's current website, ollcf.org, is currently unused. The 2010 CMU student consultants developed it but it does not have any information pertaining to the school or academics. It was created using Joomla, with the intention that the staff would customize and add information to the website. However, it fell into disuse because there are problems with the server and file system. These problems arose once the student consultant left and OLLCF were unable to address them.

Business Systems

The accounting staff does current accounting records and processes manually. OLLCF's student records and important documents are stored as hard copies, placed in vaults for safekeeping. Accounting records student's account movements (what they have paid for, what they owe) through hardcopy log books. An accountant comes each Saturday in order to check on the papers and the recordings of the clerks responsible. The Accounting is divided into: Cashier, Assessment, Clerks.. Staff keeps records of student balances on paper and compiles their records in folders. Students check their

balances at Assessment. OLLCF is working to computerize all accounting processes and at the time of this report, the school had recently hired a certified public accountant to propel the transition forward.

Current Information Management

OLLCF currently stores its student information in file cabinets, and in a few cases as excel documents on desktop computers. The student information stored includes student biographical information, previous education, medical record, current academic information, and finances. Student information is accessed through the registrar's office, through the deans of each school, accounting, and faculty have access to some student information. The following describes in-depth the different processes in each department during the enrollment process.

OPENSIS BY TCinGC 2010 STUDENTS

Student consultants from the TCinGC program in 2010 created a system with OpenSIS, an open source student information management system. The team customized the program to fit the college's needs. However, the system was never completed and college staff were unable to use the system due to errors in the system.

III. Current Enrollment Process

Research Methods

We used a variety of human-computer interaction methods in order to explore the current workflow and registration processes at OLLCF. This section offers a brief glimpse into each method and our reason for selecting its use.

Contextual Inquiry

After determining the scope of the project, we conducted a contextual inquiry, which is a specific type of interview where we asks questions to a specific staff member in their work environment and observe how their work flow. We are fortunate to begin the project during the enrollment period before classes began, because we were able to observe and interview the deans, the registrar staff and accounting staff during that time.

Modeling

Based on data from our contextual inquiries, we created sequence, physical, cultural and flow models to represent the complex workflow and processes at OLLCF.
The sequence model represents the actions people take in doing their work. The model reveals their strategy, their intent, and what matters to them. The system we create would build on these three factors and help people improve the work they do.

The flow model represents the coordination, communication, interaction, roles, and responsibilities of individuals, and this is important to depict since there are multiple flows

during the registration process between different departments and the types of students within the college.

The physical model represents the structure and layout of an individual office, as they support or present obstacles to the work of the staff and students.

Current Enrollment Process Overview

During our contextual inquiry, we identified three types of students: returning students, new students and transfer students. The enrollment processes between the three students have many similarities and differences, which are essential for our system to recognize and support. In all three cases, student records were hand written and stored in a file storage system.

Returning students

Returning students are students who have been enrolled before at OLLCF for at least one year. The sequence model on page 19 in the appendix represents the actions that returning students take to register for the new semester. Students must go through 9 phases to complete the process: (1) check the account balance, (2) pre-enroll into classes, (3) select their classes, (4) submit a course proposal, (5) pay for tuition fees, (6) register the student, (7) verify student registration, (8) distribute registration cards and (9) enroll into a class. Furthermore, students have to visit the accounting, registrar and deans office multiple times to check their curriculum requirements and their classes and obtain approval from each department/office. During the process, students fill out one pre-enrollment form (PE form) and 4 copies of the registration form. However, they have to obtain multiple signatures and stamps to ensure the accuracy of each document.

Breakdowns

The lightening bolts in the sequence diagram represent the problems or breakdowns in the process. At the moment, staff obtains student information through written forms and everything is distributed and recorded manually. Furthermore, students must obtain information through face-to-face contact and by looking at bulletin boards.

Obtaining information (Know-How)

Students ask their deans or learn through their friends how to register in the school, especially to find out how to check their account balance. At the moment, there is a bullet board that explains the process for each type of student. However, students do not refer to this board for information.

Similarly, staff members must obtain information from the students and must rely on the students to show the appropriate sheet of information. For example, the student has to show the verification slip (obtained at the cashier) to the registrar to prove that they have paid their account balances in full. The registrar office cannot retrieve that type of information from their files. This creates redundancy (re-entry and re-showing of information) and problems of accuracy in the process.

Manual/Physical Records/ Re-Entry

Students and staff must fill out a series of forms during the registration process. After the registration period, a staff member from each department manually puts in the student's

information in Excel. However, due to time and staff shortage, most of the student's information remains compiled in folders.

Delays / Back-and-Forth

Since students have physical forms that they must show to different departments, they have to visit each department to obtain the necessary approvals. However, students and staff would experience frustration from the long lines and delays when a student cannot find a particular Dean.

Multiple Checks and Signatures: Accuracy

Returning students have to show each form to the three departments, College Dean, Registrar and Accounting before they can submit the form. The college created this process of multiple checks and signatures to ensure the accuracy of each document. The College Dean checks for schedule conflicts and that the classes chosen by the student fit the curriculum requirements. The Registrar checks the accuracy of units for each class. Accounting checks the units for each class and computes the tuition fee (as tuition is charged per unit). A computerized system can reduce number of checks and signatures while facilitating the registration process.

Delivering copies to each department

Departments receive a documentation of student information manually. Students must deliver a final copy of the registration form for the department's records, with all the departments' signatures (registrar, accounting and dean).

New Students

New students have a similar process but slightly different process from returning students. They have the same number of phases (9), but since they are new students, the first two phases are different: (1) learn how to enroll, (2) prove their qualifications, (3) select their classes, (4) submit a course proposal, (5) pay for tuition fees, (6) register the student, (7) verify student registration, (8) distribute registration cards and (9) enroll into a class. The sequence model on page 22 in the appendix describes these two phases in detail.

In the first phase, new students must inquire at the registrar or at the task force table, which is a table consisting of the college deans and scholarship officers. The task force table is located in the school lobby during the two weeks of registration. The college website at the moment is void of any information pertaining to the enrollment process. Hence new students must go to the college to learn more about the process. After they learn about the process and the requirements that the college demands, students return home to get the documents that prove their qualifications. Then they go back to the college to show their qualifications to the task force staff. The task force staff interviews the new students and gives them a pre-enrollment (PE) form to continue the registration process.

Compiling the Credentials

The breakdowns in the new student registration process are similar to returning students. The only difference is the documentation of their qualifications/credentials. Students have

to compile the high school transcript and copies of the a document of Certification of Good Moral Character, birth certificate, 2x2 picture and other requirements depending on the college they are applying to. These documents are compiled in a folder kept by the registrar, but must be shown to the registrar and College Dean.

Transfer Students

Transfer students follow the same process as new students but must present more credentials to the College Deans, including their transcript from the last college and certificate of Honorable Dismissal. Furthermore, transfer students follow a customized class schedule and tuition fees than from their peers at the college.

Important Registrar Processes (During Registration)

The Registrar office processes registration information and keeps detailed information of student schedules and grades. Furthermore, they are the hub of student information for students, teachers, Deans and the Foundation. After the student registers into the college, Registrar staff generates reports and lists for the teachers, Deans, the College Foundation and CHED (Commission for Higher Education). These reports or compilations are manually typed in Excel by the registrar staff.

Flow Model

The flow model on page 24 represents the communication and tasks between people, places and objects during the registration process. The lightning bolts represent the breakdowns or problems in the process. The yellow boxes represent the objects (or in the this case, sheets of paper) being used in the process. The following are the breakdowns revealed in the model:

Inconsistency: Maintaining Records

Staff members are manually putting student info into Excel, but due to lack of time and staff resources, these digital records are incomplete. Instead, records are compiled in folders. However, during the registration process, these individual student records are difficult to find. Furthermore, the registrar uses different Excel templates (inconsistency) to document student information.

Inefficiency: Generating Reports

The Registrar office has to compile reports to CHED, the Foundation and the different departments. These reports are usually for demographics of students at the school, such as the percent of students that are male or female, the percent of students from each municipality or high school, and so on. These statistics are hand counted using the filed student records, manually typed into an excel sheet, then displayed as charts and graphs.

However, due to the time-consuming task of manually looking through student files, reports to CHED are completed late and reports to the Deans and teachers are rarely created. Deans need a report for the number of students in their department and the number of students in each class, in order to know if they need to create more class sections. Teachers want to know who are enrolled in their classes but they never receive this report. To compensate for this deficiency, teachers compile their own student class list based on the number of class cards they receive from the students.

Retrieving Information from Other Departments

Before the registrar can register a student, they must receive information if the student obtained the necessary grades on the English Proficiency Test. However, these grades are compiled by the guidance office and must be manually delivered by staff. Sometimes, the registrar never receives the list of grades. Instead they receive evidence of the grade by the student, who has a copy of the grade. The same problems occur when it comes to student grades. Teachers have to deliver a copy of their grade sheets to the registrar but sometimes fail to give a copy. Instead it is up to the student to provide proof of their grade.

Sustainability
On several occasions, student records have been lost simply because there were no backup copies of the documents. Furthermore, the student files are all hard copy, and may be vulnerable to natural disasters such as floods, or fires. There have been previous attempts to move from a paper system to a computerized system, but in several occasions, an employee unknowingly installed a virus via a USB drive, and corrupted the system. However, it is imperative that the college transition from a paper system to a computerized system before it can grow into a university, to accommodate the growing number of students.

Physical Model
The physical model on page 25 of the registrar office portrays the physical layout and workflow within the space. At the moment, there are 4 staff members and the office is looking to hire one more member. Two of the staff members are full-time (8hr/day) and two staff members are part-time (7h/hr). The physical model reveals the following breakdowns:

Limited Network
Only two computers are connected through a local network. Staff members use these two computers. Furthermore, only one computer has access to the printer. Often, the staff member would be interrupted to print reports for other staff members. The computer of the OIC is not connected, so staff members must share files via USB to the OIC. Often reports to CHED and to the Foundation are compiled by several staff members and checked by the OIC, so a network between all the computers is essential.

Technical Resources
The registrar office does not have access to the Internet. We are working with the school to create a fast, wireless Internet on campus but in the meantime, the current infrastructure could limit the type of solution we will create. Furthermore, one computer needs to be updated because it is too slow to efficiently encode data.

Important Accounting Processes (During Registration)

Students must pay at least a down payment for their tuition before they can complete their registration. Accounting checks the balances of returning students and calculates the tuitions fees of all the students. The accounting office has three divisions: Assessment, Cashier and Payroll. The sequence model on page 26 shows communication and

workflow between the Assessment Division, Cashier and student. The breakdowns are as follows:

Inconsistency in maintaining records

Similarly to the Registrar office, accounting suffers from inconsistency in maintaining records, and retrieving information from other departments. Accounting staff has difficulty in finding individual student ledgers because they have to manually look through student folders.

Inter-Departmental and Internal-Communication

The Cashier Division and Assessment Division are important during the registration office. Assessment calculates the tuition fees of a student. Then they give the student an assessment slip, which summarizes the fees. The student must then show the assessment slip to the Cashier and pay a down payment. After the student has paid, the Cashier gives the official receipt to Assessment manually. The student returns to Assessment as Assessment checks the official receipt before giving the registration card to the student.

Furthermore they have to communicate to the registrar office **through the student** that the student has paid their balance in full. To do this, Assessment provides the registration card for the student to complete, which as the same information as the PE form. After the student shows the filled-in card to Assessment, Assessment stamps the registration card. Then the student goes to the Registrar to get the card signed.

Physical Model

The physical model on page 27 of the accounting office portrays the physical layout and workflow within the space. There are four desktop computers and one laptop, used by the OIC.

Technical Resources

As shown in the physical model, one computer does not have the Internet. One computer is broken and another computer does not have a USB port. Staff members share files via USB. The computer next to the Cashier is used to compile reports. Staff members must schedule a time to use the computer.

Setting a Direction

To make our system design more consistent, we boiled down our findings from contextual inquiry and other background research into a set of design implications.

Design for a role, not a person - Many different people review records. It is important to design for this role, rather than explicitly designing for the registrar staff. The system should be usable for deans and accounting, as well as the registrar staff.

Design for both novice and expert users – All of the staff members in Accounting and Registrar are knowledgeable with Excel. It is important that the system be accessible for new users without a lot of training. However, staff members will likely become experts with the system, and should be able to create customized reports and information for CHED and the Foundation as needed.

Efficiency is vital, especially for staff members- The registration period is hectic and the registrar and accounting offices must handle multiple students at a time. This system must enable users to quickly acquire the information they need.

Retrieving and Adding information in Real Time
The registration period is hectic and the registrar and accounting offices must handle multiple students at a time. Since all processes are done manually, this creates a backlog of student folders that must be manually typed in Excel. This system must enable users to quickly acquire the information they need as they register the student. Staff members should also be able to add new students and edit information on the spot.

Allow for Inter-Departmental and Internal Communications
The system should allow all staff members to view information in real time. The system must allow Accounting to update student records for billing, so the Registrar would know which students are allowed to register to more classes. Similarly, Deans, Registrar and Accounting should be able to view student records, instead of having their own hard copies.

Physical integration is key – To facilitate the workflow and allow staff to enter information in real-time, the system we develop must be well integrated into the physical environment. This could entail a workplace restructuring, where staff members will have a computer available as they speak to students and view their records.

Make it easy to see or switch between many different pieces of information – registrar staff members need to compile reports to the College Deans, CHED and the Foundation. They must gather statistical data or create customized lists of students per class. The system must also staff members to view information quickly and create customized reports.

II. Scope of Work

Task 1. Network the Main Building

In order to utilize any future distributed information system such as a shared database or web application, a solid network needs to be in place. As it stands, the main building at OLLCF has limited network connectivity and Internet access. Aside from the computer lab on the second floor, most computers are not connected to each other such as the machines located in the Accounting and Registrar offices. In addition, these machines are without Internet access.

The team plans to make note of all computers that will potentially be a part of the network. The team will then research various brands of networking devices and order all the required equipment that is needed to create a large network in the main building. The envisioned network will include machines in the accounting office, registrar office, and machines in the president's office.

Machines on the network will grant any staff or faculty member access to the system that the student consultants plan to develop. Without this network any system built will

not be able function properly, so it is crucial to lay the groundwork at an early stage, and before real sustainable solutions are implemented.

Additional Impacts

After the installation of a network on campus, it will be extremely simple to provide Internet access to all computers on the network. The local network and addition of an Internet connection will allow staff to easily share important documents and other information. This will contribute to improved workflow and communication between all staff and faculty. Furthermore, a fully networked campus will provide any future student consultants with a solid foundation to develop shared information systems.

Feasibility

Networking all offices mentioned above is very feasible within the given timeframe. Orders for networking equipment need to be placed immediately so the school technicians have plenty of time to install the network. Once the equipment arrives, it should take approximately one week to completely network the entire main building. One problem is that the head technician is only available once a week, which may cause delays and other difficulties.

Task 2. Streamlining the Enrollment Process

The enrollment process at OLLCF is a painstakingly long and confusing process. Employees, students, and faculty are forced to do repetitive and time-consuming tasks. After a student fills out a registration form, the registrar and accounting staff must hand type reports and each student's transcript. Students must hand-write four copies of their course schedule, so that the dean, the registrar's office and the accounting office can verify it and then provide a copy with the student. Faculty must hand sign hundreds of registration and class cards every semester to hand to each of their students. These are only a few examples of the repetitive tasks that need to be performed.

There are no backup systems in place so student files are prone to damage or loss. On several occasions, student records have been lost simply because there were no backup copies of the documents. Furthermore, the student files are all hard copy, and may be vulnerable to natural disasters such as floods, or fires. In addition, the hard disk space on the staff computers is extremely limited, with space as low as 8 GB on a hard drive. After a period of time old records will have to be deleted to make room for new ones.

The registrar's office is in charge of handling vast amounts of paper containing student information. As a result, sorting documents and searching for information is time consuming. There is also only limited space in the vault so old student records cannot be kept permanently. Furthermore, generating reports for CHED and the OLLCF administration must be manually calculated and typed, for there is no system in place to do those calculations.

To solve these problems, the TCinGC team will be designing and implementing a simple shared database system in Microsoft Access 2007. The system will store student information, student schedules, course information, teacher information. The

TCinGC team will be working with faculty from the College of Computer Studies, employees from the registrar's department, and the OLLCF Administration to customize the system to fit the users' needs.

The team is choosing to use Microsoft Access because it can serve as a simple record-keeping database that can be shared across a network. Microsoft Access is a stable, widely used and supported application and will not require a significant amount of hand-written code. In addition, Microsoft Access is already installed on every computer so minimal configuration will be required.

Expected Outcomes

We believe that a low-tech shared database solution is the most meaningful and effective solution for streamlining OLLCF's enrollment process. With the current infrastructure and resources available, we are purposefully choosing to stay away from open source all-in-one solutions to school registration systems. The more code that needs to be hand-written and customized, the more testing needs to be done. Moreover, the system has more potential to break and faculty will not have the skills required to fix any bugs. Many of the faculty members are familiar with Microsoft Access and some have expertise in SQL, which leads us to believe Access may be the best solution.

Users will be able to:

-Create and Remove students in the database

- Create and Remove subjects in the database

- Create and Remove classes in the database

-Enroll students into classes

-View schedules of students

-View student and teacher information

-Generate reports based on demographics or any number of parameters

The Access database system will allow the Registrar, Accounting and Deans to have immediate access to the most up-to-date student and course information. This will reduce the amount of manual data entry and paper documents, as well as eliminate repetitive processes.

Additional Impacts

The ability to see enrollment and scheduling information for each student and class will make the class scheduling process much easier. To create the class schedule, each Dean first creates a skeleton schedule then compares it with other deans to work out any conflicts. They then estimate how many new and old students are enrolled, and in which classes they are enrolled in. To calculate the number of old students, the deans usually go to the Registrar's office and look through hundreds of teacher grade books, which have total numbers of students for each class. Deans estimate the amount of new students that will enroll based on previous years' numbers. With an up-to-date

database, deans could view the number of students in each class instantly, as well as the number of newly enrolled students.

Feasibility

Creating a shared database system in Microsoft Access is feasible within the current time frame. Because we are creating a basic data entry system for students, we expect the project can be implemented in several weeks time. This leaves three weeks to test the system and train the staff accordingly. Throughout the development phase of the Access database system, Computer Studies teacher Dario Galeon will be assisting the team with development to become more familiar with the system and build the skills necessary to maintain it after the team leaves. Darius has relational database and SQL knowledge and will be able to effectively manage the new system once it is implemented.

There are several risk factors that may affect the success of the Access database system:

-Illegal access or modification of the data

A user may gain access to the private data and manipulate it, compromising the system. To protect against intrusions or data manipulation, certain databases and fields will have passwords, and can only be accessed by specific users. Furthermore, permissions will be put in place to restrict various users from changing data they aren't responsible for.

-Improper network installation

If the network is installed improperly or the networking products do not perform up to standard, it will be difficult to share student information between departments. Testing must be done to ensure equipment is working properly and that there is a strong connection in place.

-Steep learning curve

Many of the registrar's office employees have not had experience with Microsoft Access, which makes a steep learning curve for the system. Future users should be given at least half a semester to acquaint themselves with the system, and prior to implementing a complete shift to the computerized system, OLLCF should test the system with a small batch of students, such as the students of one college.

III. Outcomes and Recommendations

Task 1. Network the Main Building

Our initial decision was to network the registrar, accounting and president's office, locations which are all central to the enrollment process. The registrar already had a 5-port hub connecting three computers, and the accounting office had two computers connected to each other. An order was placed for a 4-port router to connect all three locations under the supervision of OLLCF's head technician Rommel Patorito.

After substantial development of the enrollment system, it was decided that the network requirements would have to expand to include the dean's offices on the second floor. An order was then placed for a 16-port hub along with CAT5 cables to handle all the new connections.

A network was successfully installed, which now connects the registrar, accounting and president's office. There was not enough time to network the dean's offices as all major networking was done in the very last week of the project. The network installation process was slow and delayed for several reasons. To begin, it took three weeks for the first router to arrive, and wasn't installed for another three weeks. Another problem was that the head technician Rommel Patorito only worked one day a week, and then resigned from his position during the last two weeks of the project. It was during these last two weeks that we met two other technicians who assisted in installing the network.

Both technicians worked hard to network the machines on the first floor, and were able to successfully network the registrar, accounting and president's office during our time there. Despite the missing connections from the deans' offices, the current network is fully functional and provides a solid foundation for future projects to build upon.

Task 2. Streamlining the Enrollment Process

The scope of work discussed the creation of a simple shared database system in Microsoft Access with basic forms for data entry, but circumstances forced me to choose another solution. It was taking too long to customize forms and develop the right functionality, as I was unfamiliar with the MS Access version of SQL. Moreover, there was a lack of human and online resources to assist me with development. There were no staff members knowledgeable in MS Access, or MS Access's version of SQL. This also led me to believe that the system would not be a sustainable solution, as staff members would not be able to properly maintain or update the system after my departure from the country.

While I was developing the MS Access system, I noticed Dario Galeon, a computer studies teacher, creating a similar enrollment system in PHP. We discussed the advantages and disadvantages of both systems, and decided that Dario's web-based system was more ideal for several reasons.

With a web-based application, changes can be rolled out immediately. All clients with an updated web browser can easily access the system, and immediately see the updated changes as soon as the browser is refreshed (and after the server is restarted). With MS Access, the customized forms would have to be individually copied over to each computer each time the form was updated. I would also be able to achieve

the same functionality I wanted in MS Access, but at a much faster rate as Dario and I were more comfortable programming in PHP and MySQL.

The web application will also prove to be a more sustainable solution. Throughout the entire project Dario worked alongside me and has a deep understanding of the code and functionality. He has the ability to maintain the system, fix bugs, add new features and train staff on how to use the application.

The web application was created using a template web application from Socialengine.net, which can be viewed here: http://demo.socialengine.net/.

During the beginning stages of working with Dario, I performed a fresh install of MAMP (Mac OSX, Apache, MySQL, PHP) in order to run a local webserver and test the PHP application. I then copied over the project folder that Dario was working on into my MAMP/htdocs directory. At this point, Dario's database only contained tables for student and faculty information. My database contained the entire enrollment system schema with student, teacher, class, course and subject information and so I exported my database from the MS Access project into the PHP project. Dario also imported my database and modified his code to resolve the differences in our tables and fields.

After developing functionality for the creation and modification of classes, our concern was how to display only the classes offered in the current semester while hiding classes from previous semesters. To resolve the issue, we created a 'schoolterm' table that defines the current school term for each class. The table has fields for schoolterm ID, current semester, start date and end date, and a field labeled "open". Each class has a schoolterm ID associated with it. The "open" field is a Boolean type that determines what the current semester is – either open or closed. The idea is to have an administrator set the current semester to open, and close all the other semesters. The list of classes that have a schoolterm set to "open" will be displayed, while all others remain hidden.

The system we built allows for different access levels, and simultaneous access of information for administrators, registrar, accounting, deans, teachers, and a student assistant. We used a session variable to store the user's login information to differentiate the access level. Depending on the user's access level, the user will be able to view and edit specific information. We have researched what permissions make the most sense for the different users: figuring out what information is relevant to each set of users. This will also allow the users to view shared information throughout the system.

The final system we created is a student information system that easily facilitates the management of students, courses, subjects, classes, faculty, school terms, student enrollments, grades, and more. It will make many processes more efficient. It has seven sections, which are: Home, School Setup, Students, Users, Scheduling, Grades, and Reports. The pages and sections shown to a user are determined by his or her access level. These sections also form the basis of how the system is organized. Each section is presented as a tab and clicking on one will bring up a second menu that shows links to all of the relevant menu items for that tab.

The system makes the registration process more efficient by reducing the amount of information that needs to be collected every semester. Currently, a student must fill out

a pre-enrollment form with all of their information every semester, including name, address, course, past school information, marital status, and so on. Instead, with the new system, students will only have to provide their information as a new student, when they first enroll at the school. Then, each following semester, when they register for classes, they will only need to inform the registrar if any information has changed, such as a change of address. The only other information the registrar will need to change is the year level of the student.

Students will also copy down a list of subjects they wish to enroll in for that semester onto the pre-enrollment form. Once this schedule is checked and approved by the dean, the registrar signs it off. The student then gives the form to the accounting office and arranges payment for the semester. Only after a student has paid can he or she then be enrolled into the subjects. However, in order to do so, the student must get an official course registration form and copy down the schedule three more times. One copy goes to the dean, one to the registrar's office, and one to the accounting office.

The new system has the potential to eliminate much of this information duplication, but there is a key function missing from the application. In theory, a student will still choose his or her subjects and verify the subjects with the dean. The student will then go to the registrar who will then add the classes to the student's schedule and await verification. This information will immediately be accessible by the deans, registrar and accounting personnel. A student will then be able to go to the accounting office and pay, as in the current process. The accounting office will be able to see the classes the student has enrolled in and calculate the proper fees. They will then provide a receipt or signature, which the student will take back to the registrar. The registrar will then verify the student's schedule and enroll the student into the classes.

The only missing part of this process is the class verification functionality. When the registrar adds classes to the student's schedule, there is no intermediate step and the student is immediately enrolled whether they have paid or not. An ideal solution will have one more step where the registrar will wait for verification before finally enrolling the student. This can be a Boolean value in the enrollment database.

This process eliminates several visits to different offices that the student currently makes. It also gets rid of the need for a student to copy his or her schedule multiple times.

The accounting and registrar staff initially needed to scan through hundreds of paper documents or scroll through massive excel spreadsheets to locate student information. With the new system, the staff now has a searchable database of student and class information. They can retrieve a specific student record in a matter of seconds by searching for a student id, first name middle or last name.

Recommendation 1. Expand the local network

Deans and teaching staff both require access to the student record system to manage subjects and classes, but they currently have no connection to the local network. To make better use of the OLLCF Student Record System and any other systems in the future, we recommend expanding the network to include deans' office machines, faculty machines, and even the computer lab on the second floor for potential student access.

Recommendation 2. Create Student ID System

OLLCF is currently without a student ID system. Having an ID number for each student would allow the registrar, accounting and any other system users to easily identify students and search for student information. The naming scheme should be made up of multiple integers that will uniquely identify each student. After the ID naming scheme is determined, registrar can enter this number when adding a new student into the system. They can later search for this student by typing in the ID number in a search box.

Recommendation 3. Create Standardized Subject Codes

OLLCF currently has no standardized Subject Codes for each subject at the school. For example, an English class has the name Eng1, while a computer science class has the name Prog1. There is no departmental information associated with the subject name so it is hard to determine where the class is being offered. In addition, it is hard to sort subject information by name if there is no standard naming scheme. An ideal scheme for a subject code should have a value pertaining to the department, followed by a class number. For example, for Introduction to Programming, a possible subject code could be CS-100; CS for Computer Science and 100 for the subject. Another possibility is to replace CS with a number. Carnegie Mellon University's Introduction to Programming course has the subject code 15-100, with 15 referring to the computer science department. Any of these examples would prove to be a good solution for standardizing the subject codes at OLLCF.

Recommendation 4. Disaster Recovery Plan

There is currently no plan in place to recover from a major disaster. No computers are being backed up anywhere on campus, and if a disaster occurs to a room, all data will be lost. Plans should be made to recover data in the event of major disasters, especially as new computers are increasingly utilized. The government has frequently lost files due to fires in the past and one of the advantages of transitioning to paperless records is that they can easily be copied and stored in multiple locations.

A disaster recovery plan does not require a huge investment or extra effort. If the most critical computers and main server is backed up once a week into an external hard drive and then that hard drive is physically moved to another location then there will be a backup when disaster occurs. This solution is not ideal because it requires a person to follow this procedure each week. However it will provide some measure of security until the issues that prevent an automatic remote back up of software are resolved.

Recommendation 5. Create an Information Systems and Technology Management position.

There is currently no single staff member in charge of technology planning, maintaining information systems and other solutions developed by student consultants. While computer studies faculty members have previously been the go-to people for maintaining such systems, they are often too busy with their own classes and students to do so. It is crucial for OLLCF to have a staff member in charge of managing and improving upon the school's technology infrastructure. The school does have employed technicians for managing all computer hardware, but they mainly act as a response team to problems that arise. A staff member should be hired and put in charge of technology planning and managing any information systems installed by consultants or

other faculty. Duties would include creating a campus-wide wired or Wi-Fi network, researching Internet Service Providers and improving Internet connection speeds, and maintaining information systems such as the OLLCF Student Record System.

With two months of experience interacting with many of the technicians and computer studies faculty, I strongly recommend Dario Galeon for this technology management position. He has an excellent technical background and has already developed a working library book borrowing system for the school that was used in the past. He also worked alongside me to create the Student Record System and has the ability to update and maintain the system on his own. As a side note I would like to add that this position requires increased responsibility and should be accompanied by an adequate increase in salary.

About the Consultant

Jeremy Cohen Hoffing is a Masters in Information Systems Management student with a Bachelor's in Information Systems from Carnegie Mellon University. Upon graduation, he would like to work for a global consulting or web design firm.