



Bureau of Hospital and Clinical Services

Ministry of Health

Republic of Palau

Student Consultant: Mi Gyeong Koo
Community Partner: Dr. Selaima Lalabalavu

I. Background Information

The Ministry of Health in Republic of Palau is a governmental agency. Their vision is “Healthy Palau in Healthful Environment”.

Their mission is,

The Ministry of Health shall take positive actions to:

- *Attain healthful environment*
- *Promote health and social welfare*
- *Protect family health and safety*
- *Provide health care service throughout the Republic of Palau*

The ministry of Health contains two main bureaus: Bureau of Public Health and Bureau of Clinical Services. Bureau of Clinical Services focuses on providing medical service. They are located in Belau Hospital which was built in 1991. Bureau of Public Health deals with providing resources, education, and knowledge to improve people’s health level.

There are 352 employees, including 22 physicians, 5 dentists, and about 120 nurses. Hospital has an IT department with 3 staff members. Dr. Lalabalavu, the community partner, is the director of Bureau of Hospital and Clinical Services.

Since collecting data is really important for the hospital, each department under Bureau of Clinical Services has log book and electronic database such as MS Excel or MS Access. However, there is no central database system which keeps track of data from each department. Therefore, it’s each department’s responsibility to keep track of data and generate reports based on the data.

II. Consulting Tasks

The main problem observed in Bureau of Hospital and Clinical Services is that despite of the well collected data, generating utilization report was challenge. The main obstacle was technology knowledge to manage database in computer. In order to make generating report process easier, the consultant chose the following tasks.

Task 1. Analysis on current database and standardized monthly report template

Since monthly utilization statistics report was not delivered to directors and executive members of hospital, it is really hard for them to make any type of decision and understand hospital's service in detail. Therefore, analyzing current database and coming up with standardized monthly report template can help setting up the regular monthly report process in the hospital.

The consultant took a closer look at log books and electronic database from all twelve departments under Bureau of Clinical services. Asked set of questions to find out how the data is managed in each department and generated comparison chart about the database management system. Also, she organized a chart with all the fields from each department.

Task 2. Creating Database for Laboratory

Laboratory has wanted to have an electronic database. However, due to busy schedule and shortage of staff, it was hard to assign someone to focus on working on developing electronic database. With the consultant's help, laboratory decided to assign March, one of laboratory staff member who has experience in developing Access database and Excel, to develop Access database. However, due to 3 month micro-biology test training held in Taiwan, March had to leave while he and the consultant were in the process of analyzing 21 log books in the laboratory. After March's departure, the consultant worked on developing Access database based on the log books. She also created instruction manual for the new database.

Task 3. Excel Training

One of the main reasons for delay in generating any type of report is due to lack of staff members in the hospital with appropriate Excel skills.

Excel training sessions will make the process of making report quick and easy. Also, training nurse on basic features of Excel will help sustaining current Excel spreadsheet database in the Bureau of Clinical services.

Excel training session was done using Excel 2007. This is because many computers in the hospital have Excel 2007 and the new computers that hospital might get in the future will have Excel 2007. The training was divided in to two sessions: (1) Intro to Excel 2007 and (2) Filtering and creating chart using Excel 2007. The consultant held three sets of Excel training sessions.

III. Outcomes Analysis and Recommendations

Outcomes:

- Chart of analysis of current database and standardized monthly report template
- MS Access database for Laboratory
- Improved Excel skills

Recommendations:

- Merge admission and discharge Excel sheet from Medical ward and Pediatric ward into one Medical ward Excel sheet and Pediatric ward Excel sheet

- Have a regular Excel discussion session or training session
- Explore Laboratory Database and make modification if needed

Community Partner

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About the Consultant

Mi Gyeong Koo
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Mi Gyeong graduated in May 2009
with BS in Computer Science.
She will be going to Tsinghua University to
pursue Master's degree in Management Science.

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I. About the Organization

Organization

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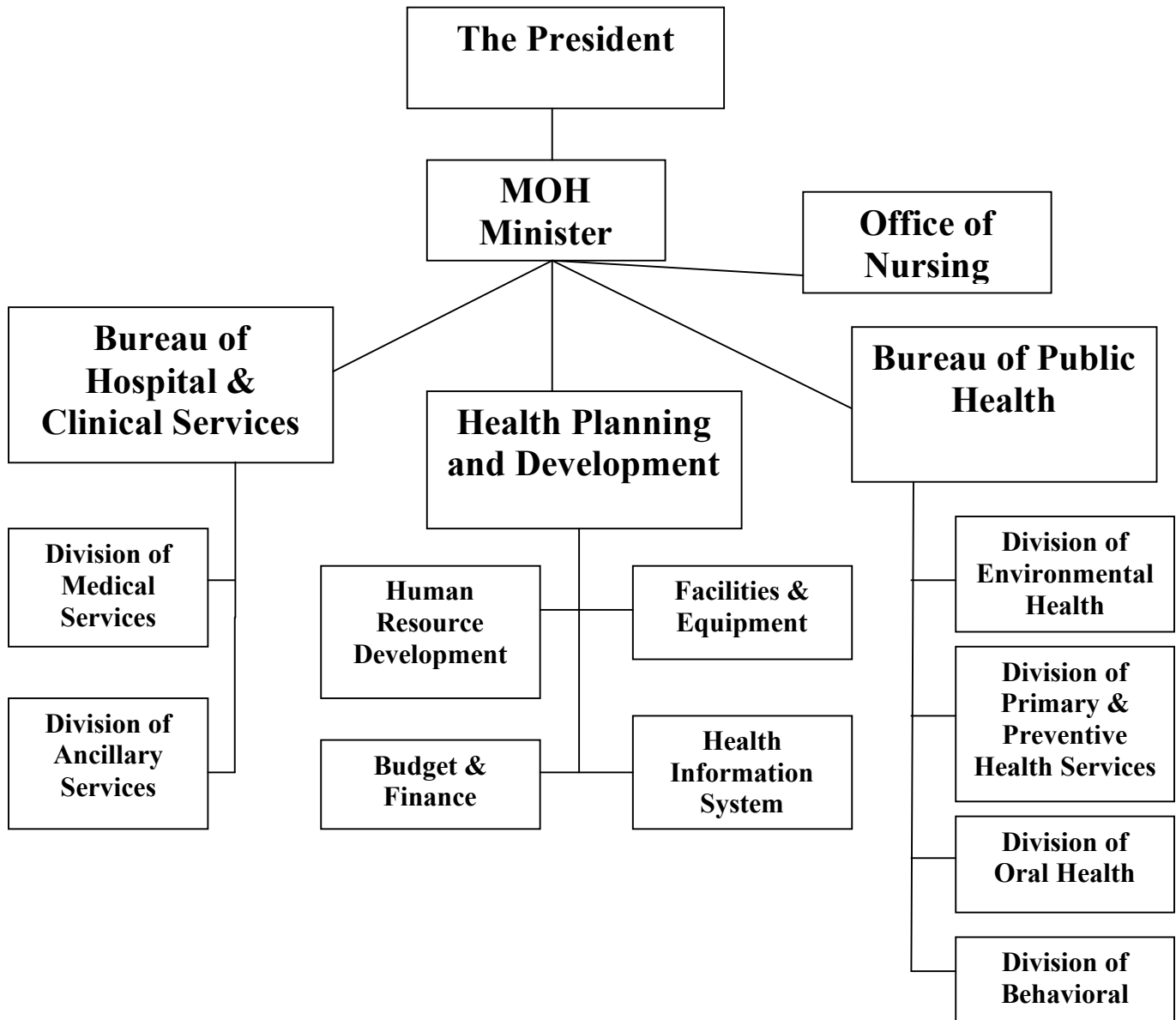
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Facilities

Ministry of Health (MOH) is located in Koror state. Both office for Bureau of Public Health and Bureau of Hospital and Clinical Services (BHCS) are located in Koror. BHCS serves entire population, approximately 21,000 as of 2009 in Palau. In BNH, there are about 80 beds (from 2007/2008 facts & figures brochure), radiology lab with x-rays and CT, and level 1 laboratory. There are 4 remote dispensaries to provide immediate medical support besides Hospital.

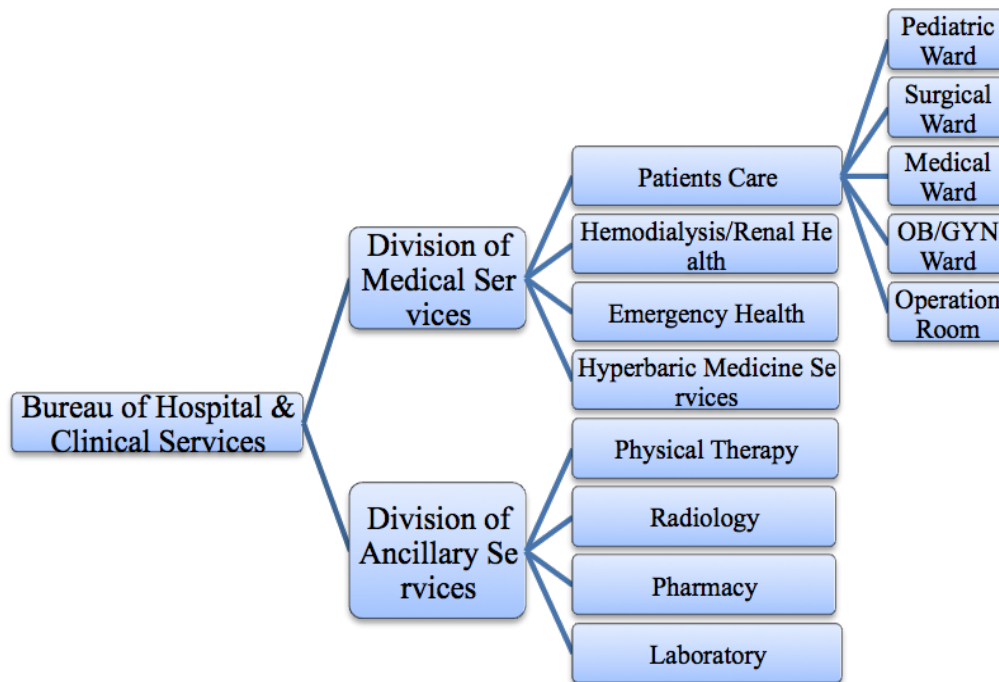
Programs/Departments

MOH Organization Chart



The partner Dr. Lalabalavu is the director of Bureau of Hospital and Clinical Services and also consultant's supervisor. The consultant will mainly work with both divisions of the Bureau of Hospital and Clinical Services.

Bureau of Hospital and Clinical Services Organization Chart



Staff

Stevenson Kuartei MD is the Minister of Health. There are 352 employees, including 22 physicians, 5 dentists, and about 120 nurses. Nurses in Clinical Services rotate wards/department upon request from wards/departments. Most of the employees feels comfortable using computer. They can access internet and generate documents using Microsoft Office applications, including Word, Excel, and Access. Some use Microsoft Office Access to manage database.

Dr. Lalabalavu, our partner, is the director of Bureau of Health and Clinical Services. She is an internal medicine physician. She got her doctor's degrees in MB Ch B from University of Ontago located in New Zealand.

In the MOH, there is an IT department as well. There are three full-time employees: Everatt Belelai, Mindy Sugiyama, and Deana Tmekei. Everatt is the Information System Manager, Mindy is the Network Engineer, and Deana is Computer Software Specialist. They are in charge of all the works related to Technology in the Hospital. Toshi is another IT staff member in Bureau of Public Health, but he's not under MOH's IT department. He mainly works on building database for Public Health.

Technical Environment

Hardware

There are about 250 computers and each department has at least one computer. Computers are purchased based on the need and available funding. Most of the computers are Dell, HP, and Micron PC. All the computers are operating on Windows system. Since computers are purchased and replaced based on needs, the version of OS varies from Microsoft XP to Microsoft Vista.

There are 8 servers:

- 2 for information from Radiology department
- 1 for paging system
- 1 for shared file system, email, and website
- 1 for DNS
- 1 for Public Health
- 1 for firewall
- 1 for backup

The radius of paging system is 25 mile. About 40 pagers are used among the minister, on-call doctors, directors, IT staff, and maintenance.

Software

All software is run on the individual computers. Each computer basically has Microsoft Office Word, Excel, and Access installed. The version of Microsoft Office also varies from 2000 to 2007. AVG anti-virus software is used to protect computers. Computers in Radiology department has special program for scanning x-rays and handling images from CT.

Network

All the computers are connected to BHCS's network. Internet service is based on 512 kbps connection. Since all the computers are connected to this one network, the network gets slower during the day when most of the people are accessing internet. There are 9 wireless access points in Bureau of Hospital & Clinical Services. These access points are connected by fiber optic backbone. Remote dispensaries are connected with three long range wifi antennas.

Technical Management

IT department is comprised of three staff members, Everatt, Mindy, and Deana. They are responsible for managing every technical machine, even the machines in Radiology department. Whenever people face problem with computer and computer peripherals, or even when they want to generate some report from Hospital Information System (HIS), IT staff were in charge of responding all these requests. Therefore, getting the technical help from IT department sometimes takes time.

Mindy is the IT person who primarily handles antivirus and software installations and updates. Deanna oversee backup for the current HIS. Everett manages any other backups that are occurring.

HIS is involved in web development for the hospital. However, HIS does not develop or maintain database for any wards in Clinical Services division. This is because IT staffs are already overloaded with larger hospital projects, which usually takes months to finish.

Internal and External Communication

Internal Communication

All the staff members in MOH have email from MOH account. Internal communication is mostly done via email or over the phone. On-call doctors and some other staff members can be reached by pager. For the communication with remote dispensaries, fax, email, and phone are mostly used.

External Communication

External communication is mostly done via email and phone. For medical referrals from hospitals in Manila, Guam, and Hawaii, MOH mainly uses email to send/receive documents and information about the patient. This is one of the reasons why stable internet connection is very important in MOH.

Information Management

MOH has a Health Information System (HIS) database which is central database system which attempts to keep track of all the data from the entire hospital. It was built in July 1996 by Walter Morton. He had a company in Palau and participated in development and implementation of the current HIS software. Current HIS has following functionalities: Encounter and patient registration at the hospital and most dispensaries (those connected to the network), patient billing for Finance (Billing and Collections department), birth and death registration for Medical Records Dept, and it has various reporting functionalities for each of these major modules (Encounters, Accounts Receivables, and Medical Records). Main users are from Billing and Collections, Dental, and Public Health. Users in Clinical services division are from OPD.

This HIS does not keep track of detailed data from each ward. Therefore, each ward has its own log book, Excel spreadsheet, or Access database to keep track of their data. Followings are details of database management in each ward and department under the Clinical Services division.

- Patients Care
 - OB/GYN Ward: Assanuma, the clerk for OB/GYN Ward, is in charge of the department's database. MS Excel 2003 spreadsheet it used as well as log book. She is the only one who inputs data and generates reports. Flash drive is used for back up as well as sharing data among other wards.
 - Surgical Ward: Marlyn, the clerk for Surgical Ward, is in charge of managing the department's database. She asked Toshi, IT staff in Public Health, to build a user friendly database which can generate monthly and annual report. It was developed in end of 2007 using MS Access 2003.
 - Medical/Pediatric Ward: Shamila, the clerk for Medical and Pediatric Ward, in charge of both departments' databases. She uses MS Excel 2007. Medical ward used to have Access database built by CMU student consultants in 2006. However, Shamila was having hard time using Access because it was hard to change fields.

- Hemodialysis/Renal Health: Used to have Excel spreadsheet to keep track of daily patient's record in 2006. When the nurse who was in charge of managing Excel database was rotated to the other department, nobody at the Hemodialysis department continued to use the Excel database. Right now, they use log book and manually generate monthly report based on that log book.
- Emergency Health: Only log book is used.
- Hyperbaric Medicine Services: Hyperbaric chamber is used when there is a patient needing to use it. The patients are usually divers who ascended rapidly and did not have enough time to take nitrogen out of the body. Log book is used to keep track of data.
- Physical Therapy: Access database and log book are used. Access database was built in 2006 by CMU student consultants. It was developed in MS Access 2003. When the computer they used to manage database was broken two months ago, they got a new computer which runs on Windows Vista and has MS Office 2007. There was an error transferring database from Access 2003 to Access 2007, so they stopped using database. Flash driver is used for back up.
- Radiology: Access database built by CMU consultants in 2006 are still used in this department as well as log book.
- Pharmacy: Pharmacy developed its own database system 6 months ago by WHO. Pharmacy department applied for database development a program sponsored by WHO. A consultant from WHO Philippine came in to Palau and built the database using Access. When Pharmacy faces any technical problem regarding to database system, they just call the consultant for further help and the problem is usually solved within 3 days. The consultant will come twice a year as a one of the following check up. This database manages pharmacy and its warehouse. However, the computers that are connected to this database network are not connected to central hospital server. If other department wants any database from pharmacy, they need to request it in person.
- Operation Room: operation room has both paper log book and Access database which was created by Toshi in December 2007. There are several problems with Access database. One of the problems with Access database is that it does not contain all the fields in the log book. Another problem is that there are multiple copies of database in the computer. Each copy has different set of database. According to Wolcatt, the nurse who is in charge of database, each nurse inputs data in different copies of database. Also, back up database, which is stored in a flash drive, and the copies of database in the computer are missing a form. Therefore errors occur often. Even though it takes long time, nurses feel more comfortable using log book to generate reports. Dr. Jimenez, the anesthesiologist, keeps her own log book of operations for her own records.
- Laboratory: laboratory has about 20 log books for each lab/examination they do.

See appendix A for database detail comparison chart.

Since current HIS is not widely used to manage data in the departments of BHCS, sharing data between departments are usually done via email, in-person with flash drive, or phone.

Technology Planning

MOH has been working on developing new web-based Quality Hospital Information System (QHIS) for last five years. IT department is working with a local company called PRA to develop this software.

Its purpose is to have an online data management system which not only contains all the functionalities from current HIS, but also has various reporting functionalities for each of Encounter, Accounts Receivables, and Medical Record. In addition to that, Nurse and Doctor's Workbench, which has encounter registration functionality, Procurement module, which keeps track of purchase order, and Inventory module, which has inventory tracking, dispensing, and receiving. Nurse and Doctor's Workbench will obtain all the detailed data from each department in the Clinical Services Division.

As of August 2009, financial part of HIS has been completed and installed for the test runs. Also, most of the functional aspects of system have been fully adopted except for minor interface adjustment.

Business Systems

MOH is a government agent, so they are supported by federal budget. On top of that, MOH is also getting grant from various health organizations such as World Health Organization (WHO), and US organizations such as Center of Diseases Control (CDC), the Substance Abuse and Mental Health Service Administration (SAMHSA), and the Health Resources and Services Administration (HRSA). MOH also receives grants and supports from other countries, such as Japan and Taiwan.

II. Scope of Work

Problem Observed

The main problem observed in the Bureau of Hospital and Clinical Services is that reports are not generated on time. Dr. Lalabalavu, the community partner, identified the need of monthly utilization statistics report from every department. Also, all the clerks and doctors said that the problem is that after collecting data, they have hard time generating monthly report. Monthly report on the hospital utilization statistics, such as number of patients in each department and number of services provided in each department, is crucial for acting directors of Medical Services division and Ancillary division in order to make decision for the following month. Clerks and doctors also expressed the need for help with generating report. In order to reduce the amount of time in generating report, there are several tasks to be improved.

1. Having standard format for monthly report and have a deadline to turn-in the statistics.
2. Creating database for those department without electronic database in order to generate monthly report easily.
3. Excel training focusing on how to filter data in order to generate report.

Improving the process of reporting will make administrators to have more accurate report about the department on time. This will definitely have effect on the decisions to be made about the hospital and it will give better opportunity to serve more patients.

Task 1: Analysis current database and standardized monthly report template

The main problem that administrators of hospital usually face is that making any type of decision is hard because they do not have hospital utilization statistics to refer to before making decision. This means that capturing what's needed and supporting each department is hard. If monthly report is regularly generated and turned in on time, it will make the process of decision making much easier for Acting Chief of each division. This will provide better service to patients. In order to establish standardized monthly report form, analyzing what type of information is needed and collecting what type of information is kept track of in each department is necessary. Based on the information collected, a monthly report template can be made and used uniformly throughout the departments. Also, having analysis of current database can help planning for future database.

In order to collect data about current database, the consultant needed to talk with clerks and nurses who were in charge of managing database from every 12 departments under Bureau of Hospital and Clinical Services. With the collected data, the consultant analyzed all the fields from each database or log book and highlighted the common fields. This report can be used as a reference when the hospital creates an integrated central electronic database.

Based on the chart with database fields, the consultant created standardized monthly format for 9 departments: Surgical Ward, Medical Ward, Pediatric Ward, OB/GYN, Physical Therapy, Radiology, Operation Room, Emergency Room, and Laboratory. Hemodialysis department and pharmacy already have their own monthly report templates which have been used. Hyperbaric chamber is not used as often, so in Dr. Lala's opinion, they did not need to have a monthly report. The report from hyperbaric chamber can be done when it's used.

Task 2: Creating Database for Laboratory

Each month, there are hundreds of tests done in the laboratory. Their method of keeping record is log book for each test and there are about 20 log books. There are two main problems in the laboratory department: there is no electronic database and there is no clerk to input data. Having an electronic database will reduce the time to generate monthly report, as long as someone inputs the test result. March, one of the laboratory staffs, is familiar with both MS Access and Excel and he will be in charge of training staff members in laboratory department. Since laboratory has more than 69 different types of tests, using Access was easier to manage than Excel.

In order to create the database, the steps the consultant took are as following. First, the consultant collected every copies of log book that laboratory is keeping track of. Then, analyzed them in a chart, so that it is easier to see which test is under which category and which test has what type of results. After the analysis was done, the consultant came up with ER-diagram and implemented the chart into Access database.

The Access database has following functionalities: entering patient's information, entering test requests, entering test result, searching for test request history, and searching for test results. When the database was finished, the consultant had presentation on how to use this new database with the entire laboratory staff members.

Task3: Excel Training

On top of standardized monthly report for internal usage, there are many different types of reports that doctors, nurses, and clerks are asked to generate. Palau Hospital receives lots of funding from

many different organizations, so the type of reports that doctors and clerks have to make varies. Due to lack of staff member who can use Excel's filtering feature to generate report, the process of generating report has been long and inconvenient for both doctors and clerks. Current process of generating report is either manually counting log book or asking IT department to generate it. The latter way might take more than a month.

Training clerks and nurses, who are responsible for generating report, will make the process of making report quick and easy. Also, training nurse on basic features of Excel, such as creating spreadsheet, inputting data, and filtering data, will help sustaining current Excel spreadsheet database in the Bureau of Clinical services.

Excel training session was done using Excel 2007. This is because many computers in the hospital have Excel 2007 and the new computers that hospital might get in the future will have Excel 2007. The training was divided in to two sessions: (1) Intro to Excel 2007 and (2) Filtering and creating chart using Excel 2007.

Following is the topics that were covered in each session:

(1) Intro to Excel 2007

1. Importance of collecting data
2. Why Use Excel
3. How to plan for making a Excel Spread sheet
4. Over view of Excel 07
5. Excel Terminology
 - a. Worksheet
 - b. Workbook
 - c. Cell
 - d. Ribbon
 - e. Name Box
 - f. Insert Function Button
6. Entering Data
 - a. Click the cell, type the data, press enter
 - b. Types of data can be entered: text, numbers, dates, times, formulas, functions
7. Customize spread sheet
8. Introduce Formulas
9. On-hand exercise: Creating excel spreadsheet

(2) Filtering and Creating Chart using Excel

1. Filtering Data
2. Creating Chart
3. On-hand exercise: filtering data and creating chart based on the result from filtered data

There were three groups of participants who attended to the training session. Group I and II were clerks from wards and administration office. Group III were mainly nurses.

Following is the schedules for the training session and number of participants in each session:

July 14th

8:30am-11:30am: Intro to Excel 2007 for group I (5 participants)

1:00pm-04:30pm: Intro to Excel 2007 for group II (8 participants)

July 15th

8:30am-11:30am: Filtering and Creating Chart for group I (5 participants)

1:00pm-04:30pm: Filtering and Creating Chart for group II (10 participants)

July 23rd

1:00pm-04:30pm: Intro to Excel 2007 for group III (7 participants)

July 24th

1:00pm-04:30pm: Filtering and Creating Chart for group III (6 participants)

The consultant took attendance each time and sent out presentation slides to participants in pdf format.

III. Outcomes and Recommendations

Task 1: Analysis current database and standardized monthly report template

Outcome:

There is a standardized monthly utilization report template which is based on Dr. Lala's need at the end of each month. Also, each department has its own monthly report format containing all the utilization statistics in the standardized monthly report format. Monthly report template are created for Surgical Ward, Medical Ward, Pediatric Ward, OB/GYN, Physical Therapy, Radiology, Operation Room, Emergency Room, and Laboratory. Hemodialysis department and pharmacy already have their own monthly report templates which have been used for a long time. Since hyperbaric chamber is used very rarely, Dr. Lala said she can just ask for the statistics when there is a patient.

Additionally, the details of current database management system and details of fields that each department is collecting have been put into a chart format.

Impact on Mission:

Once the template is widely used periodically, it will help supervisors and directors of hospital to understand the trend of services provided and make decision to improve service environment in the hospital. On top of that, the analysis chart of database fields and details of database will be a good reference for information management in the future.

Sustainability:

The sustainability for this template is ambiguous at this point. This is because the deadline for turning in this report and person to turn in is yet to be determined. Once someone is assigned to collect data and compile the monthly reports to generate a combined report, this monthly report template can be used for a long time.

Task 2: Creating Database for Laboratory

Outcome:

Access database is created for Laboratory. This database stores the result of tests and history of patient's test request. Also, instruction manual for the database is created.

On main page, user can select one of the four options: Enter patient's information and test request, Enter test result, Search history and result, Open patient request history table.

Patient's information includes hospital number, first name, last name, gender, and date of birth.

Request date, referral doctor and wards, and type of tests are stored in test request table. In 'Enter patient's information and test request' page, user can input new patient's information or search for existing patient's information. Then record test request information in the subform.

When entering test result, user will go into 'Enter test result' page. In that page, existing patient's information and his/her test request can be searched by hospital number. It is user's responsibility to double check if the information is identical to patient's information that the user is trying to input the test result for. Searched patient's information and test history cannot be modified in this page. When the test request exists, user can find the tab button with the test name and input the test result.

Searching history and result has similar interface as entering test result page. User can search patient's information, test request history, and test results using hospital number. Results for every test will be shown in on page, so that user can scroll down and right to see different test results. Each test result table has its little search option, so it is easy for users to search for specific test result.

Due to shortage of time, the consultant was not able to implement the monthly report feature in the database. However, any type of utilization report can be created using filtering feature in Access. 'Open patient request history' will allow users to see patient's request history table. Using this table and built in filtering feature of Access, users can filter out the information they need and get the utilization numbers.

Appendix B contains screen shots of laboratory's Access database.

When the database was finished, the consultant had presentation on how to use this new database with the entire laboratory staff members.

Impact on Mission:

Laboratory has been making reports by manually going through logbooks. Also, when there was a request to find out previous data, they would have to spend significant amount of time manually finding it from the logbook. Therefore, doctors also had to wait significant amount of time to get the test result and make any type of decision on the patient. With the Access database, the amount of time laboratory staff would have to spend will be considerably reduced. On top of that, doctors will receive the information they need on time, so they can provide better service to the patients.

Sustainability:

In the process of analyzing logbooks, March, the community partner from Laboratory, had to go to Taiwan for 3 months for micro-biology test training. Therefore, the consultant had to create Access database without community partner working with her. This means March will not have chance to talk to consultant in person about the database and will have to learn about the database from the instruction manual. The consultant had presentation about how to use the database. However, since March was not able to attend the presentation, he would have to explore the database by himself.

In the beginning of the program, Francis, the head of Laboratory, said he is looking for a clerk to input data in the computer. At this point, they could not find a clerk for database entry. Therefore, in

order for this database to be useful, each staff member has to learn how to use database and spend time on inputting data regularly.

Currently, laboratory staff members have the instruction manual and had a presentation about how to use database. Sustainability of this database depends on how much laboratory staff members understand and feel comfortable using it.

Another sustainability issue is that according to Fransis, laboratory does not have a computer which is working properly. Most of them are pretty old or infected. He is looking forward to get a new computer working without problems just for the database entry.

Task3: Excel Training

Outcomes:

Clerks and nurses understood the importance of organized data and how to organize data in Excel spreadsheet. During each session, there was a hands-on exercise where participants had to use all the skills that were covered during the presentation. Prior to the Excel Training session, the consultant was able to upgrade Excel 2003 to Excel 2007 on 6 computers. The consultant went around the computer lab and helped participants one-on-one. Hands-on exercise for Intro to Excel 2007 session was about creating a simple chart with admission date, discharge date, duration, cost, average number of admission days per patient, total cost, and average cost per person. In order to complete the chart, participants had to format admission and discharge date columns in 'July, DD, YYYY' format, set cost column in currency format, and use functions and formulas to find out duration and other statistic numbers. The second hands-on exercise was based on randomly selected records from Radiology department to find out utilization statistics using filter function. The utilization statistics were used to exercise making charts and graphs. All the participants felt more comfortable using Excel and they seemed to be confident about using it in the future.

After the training session, the consultant sent out the presentation slides in PDF format. This manual will be a good reference and the amount of time to produce a report will be significantly reduced.

Impact on Mission:

Current electronic database in Hemodialysis department could be used again by nurses. This will help Hemodialysis department to shorten the time to generate report. Also, Emergency Room might adopt Excel spreadsheet database if any of the nurses can easily manage it. In this way, monthly reports can be generated on time and it can make decision making much easier.

Feasibility:

As long as people, clerks and nurses keep on exposing themselves to Excel, they will get more comfortable using it. Many clerks and nurses who attended this training session were already using Excel spreadsheet to keep the records and

Recommendation 1. Merge admission and discharge Excel sheet from Medical ward and Pediatric ward into one Medical ward Excel sheet and Pediatric ward Excel sheet

In the process of analyzing database, the consultant found out that both Medical Ward and Pediatric Ward are having two separate Excel spreadsheets for admission and discharge. About 80% of fields

were identical in admission database and discharge database. The consultant came up with sample Excel spreadsheet where both admission database fields and discharge database fields are merged together. The consultant emailed the example of merged database to Sharmila, the clerk who is in charge of both Medical ward and Pediatric ward. If Sharmila finds it being more comfortable to use the example Excel spreadsheet style, she should use the merged spreadsheet other than two separate sheets. Sharmila attended Excel 2007 training session, so she has capacity to make a new Excel spreadsheet with integrated data fields.

Recommendation 2. Have a regular Excel discussion session or training session

After three sets of Excel training session, many people who could not make it to all three sessions asked the consultant if she was having another training session. Nurses and clerks seemed to be really interested in learning more about Excel. If regular Excel discussion session can be organized, clerks and nurses can learn from each other and expand their knowledge. Also, if anyone in the hospital has capacity to hold periodic Excel training session, it will help clerks and nurses to get more comfortable using Excel. This way, nurses and clerks can easily use Excel to generate any type of reports.

Free online training and information are available on the following websites.

<http://www.fgcu.edu/support/office2007/Excel/index.asp>

http://www.baycongroup.com/excel2007/01_excel.htm

Recommendation 3. Explore Laboratory Database and make modification if needed

During the process of creating laboratory database, March, who was supposed to work with me throughout database making, had to leave for the micro-biology training in Taiwan. This reduced the amount of communication between consultant and laboratory staff. Therefore, some modification to fit laboratory's requirements might be necessary. Therefore, it is highly recommended that laboratory staff should explore the new database and see if there is any functionality missing or need to be modified. If modification is necessary, March should be in charge of examining what the problem is and make modification or find someone to make the modification.

About the Consultant

Mi Gyeng Koo graduated from Carnegie Mellon University in May 2009 with Bachelor's Science degree in Computer Science and double majored in Chinese. She will be going to Tsinghua University in Beijing, China to pursue a Master's degree in Management Science.

Appendix A.

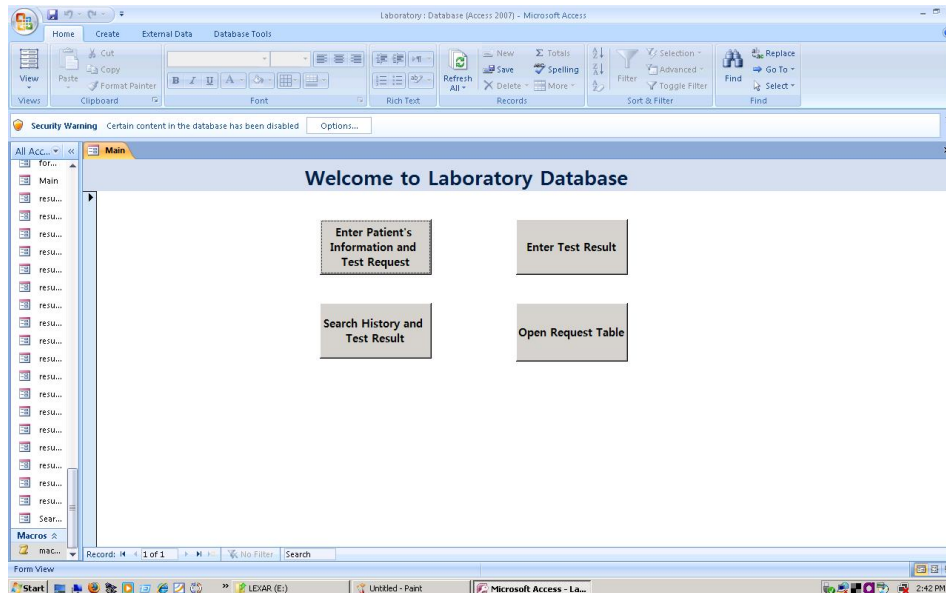
Database details comparison chart from all 12 Clinical Services Division departments.

	MW	PW	SW	OB	PHAM	XR
Logbook	Y	Y	Y	Y	Y	Y
Database	Excel03	Excel03	Access07	Excel03	Access07	Access07
Built in year	2009	2009	Dec 07	2005~2006	Feb09	Aug 06
Built by	Shamila	Shamila	Toshi	Dr. Decherong	WHO	CMU
Backup	Flash Drive	Flash Drive	Flash Drive	Flash Drive	Flash Drive	Flash Drive
Technical Support	HIS	HIS	HIS	HIS	WHO	HIS
Inputting Data	Shamila	Shamila	Marlyn	Assanuma	Anyone in PHAM	Anyone in XR
Managing Database	Shamila	Shamila	Marlyn	Assanuma	Morgan	Anyone in XR
Reports are generated by	Steve-Nursary Supervisor	Steve-Nursary Supervisor	Marlyn	Assanuma	Morgan	Lisa
Generating Report Method	Excel 03	Excel 03	Report built in Access	Excel 03	Report built in Access	Manually done from Log book
Sharing Data	Flash drive	Flash Drive	Flash Drive	Flash Drive	Flash Drive	Flash Drive
With whom you need to share data	Nobody	Nobody	Nobody	Nobody	Nobody	Nobody
Satisfied with current database? (0~5)	5	5	4 (detailed report generating feature would be nice to have)	5	5	5
Problem			Wants to make some modification in the database, but does not know how to make changes			Wants to make some modification in the database, but does not know how to make changes

	PT	LAB	HYBARIC	OR	HD	ER
Logbook	Y	Y	Y	Y	Y	Y
Database	Access07	N/A	N/A	Access 07	N/A	N/A
Built in year	Aug 06	N/A	N/A	Dec 07	N/A	N/A
Built by	CMU	N/A	N/A	Toshi	N/A	N/A
Backup	Flash Drive	N/A	N/A	Flash Drive	N/A	N/A
Technical Support	HIS	HIS/ March(for minor technical problems)	HIS	HIS	HIS	HIS
Inputting Data	Anyone in PT & volunteer enter the old data	Whoever did test will record the result	Nurses	Nurses	Anyone in HD	Anyone in ER
Managing Database	Jason	Whoever did test will be responsible for managing the data	Nurses	Nurses	Nurses used to manage database	Anyone in ER
Reports are generated by	Jason	March	Nurses	Wolcatt	Felix (in surgical ward)	Anyone in ER
Generating Report Method	Ask Mindy (HIS) to generate report for them	Manually done from log book	Manually done from log book	Manually done from log book	Manually done from Log book	Manually done from Log book
Sharing Data	Flash Drive	Paper	Paper	Flash Drive	Paper	Paper
With whom you need to share data	Nobody	Whoever wants patient's test result	Nobody	Whoever wants the operation data	With Patient: only when they go off the island	Nobody
Satisfied with current database? (0~5)	4 (inputting data is easy, but generating report takes time)	2 (Wants to have electronic database)	4	2 (Nurses feel more comfortable using logbook)	5	5
Problem	Wants to make some modification in the database, but does not know how to make changes			There are multiple copies of the Access databse in the computer and missing some forms		There is nobody who can manage any type of electronic database

Appendix B.

Screen shots of laboratory's Access database



(a) The Main Page

The screenshot shows the 'Enter Patient's Information and Test Request' form. The title bar reads 'Laboratory : Database (Access 2007) - Microsoft Access'. The ribbon includes 'Home', 'Create', 'External Data', and 'Database Tools'. The form contains the following fields:

- Hosp Num: 24567
- Last Name: Yaoch
- First Name: Israella
- Gender: Female
- Date of Birth: 7/9/1929

Below the form fields is a table with columns: Admin Dat, Ward, Doctor, Chemistry, Cannabinoids, Influenza, APTT, Ethanol, and Chlamydia. The table contains two rows of data:

Admin Dat	Ward	Doctor	Chemistry	Cannabinoids	Influenza	APTT	Ethanol	Chlamydia
3/26/2009	patient (OPD)	Dr. Lala	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7/28/2009	CDC	Dr. Bo Too	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The bottom status bar indicates 'Form View' and 'Records: 1 of 2'. A 'Close' button is located at the bottom right of the form.

(b) Enter Patient's Information and Test Request page

Laboratory: Database (Access 2007) - Microsoft Access

Home Create External Data Database Tools

Views Clipboard Font Rich Text Refresh All Save Spelling Filter Advanced Find Replace Selection Advanced Find

form_enter_result

Enter Result

Hosp Num: Last Name: First Name:
 Gender: Date of Birth:

pe_id	Admin Date	Doctor	Ward	Chemistry	APTT	Bleed Time	Blood Type	Blood X-match
16	3/26/2009	Dr. Lala	Outpatient (OPD)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	7/28/2009	Dr. Bo Too	CDC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Records: 14 1 of 2 No Filter Search

pe_id	Sodium	Potassium	Chloride	CO2	BUN	Creatinine	Calcium	Magnesium	Phosphorus	Cholesterol
16										

Records: 14 1 of 1 No Filter Search

Form View

Start LEXAR (E:) Untitled - Paint Microsoft Access - La...

(c) Enter Result page

Laboratory: Database (Access 2007) - Microsoft Access

Home Create External Data Database Tools

Views Clipboard Font Rich Text Refresh All Save Spelling Filter Advanced Find Replace Selection Advanced Find

Search Patient History and Result

Search Patient History and Result

Hosp Num: Last Name: First Name:
 Gender: Date of Birth:

Patient History

Admin Dat	Doctor	Ward	Chemistry	APTT	Bleed Time	Blood Type	Blood X-match	CBC	Coombs	PT/INR
3/26/2009	Dr. Lala	Outpatie	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7/28/2009	Dr. Bo Too	CDC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Records: 14 1 of 2 No Filter Search

Chemistry Result

Admin Dat	Sodium	Potassium	Chloride	CO2	BUN	Creatinine	Calcium	Magnesium	Phosphorus	Cholesterol

Records: 14 1 of 1 No Filter Search

Hematology: Blood X-Match Result

Admin Dat	Patient Blood Type	Donor's Name	Donor's B	Donor's Blood Type	Hgb	HCV

Records: 14 1 of 2 No Filter Search

Form View

Start LEXAR (E:) enter_resul - Paint Microsoft Access - La...

(d) Search Patient History and Result page