UNIVERSITI TEKNOLOGI MARA
FACULTY OF INFORMATION MANAGEMENT

INDUSTRIAL TRAINING REPORT:
KPJ PAHANG SPECIALIST HOSPITAL
26060 KUANTAN, PAHANG

SPECIAL PROJECT:
MEDITOUCH SYSTEM (HIMS)

BY
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KAMARUL ZAMAN
2015115645

IM245 - BACHELOR OF SCIENCE (HONS.)
INFORMATION SYSTEM MANAGEMENT
FACULTY OF INFORMATION MANAGEMENT
UNIVERSITI TEKNOLOGI MARA KELANTAN

01st FEBRUARY 2018 – 30th JUNE 2018

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FACULTY SUPERVISOR
PUAN NURUL ANNISA BINTI ABDULLAH

REPORT SUBMITTED IN FULFILLMENT OF THE
REQUIREMENT FOR THE INDUSTRIAL TRAINING
FACULTY OF INFORMATION MANAGEMENT
UNIVERSITI TEKNOLOGI MARA KELANTAN

01st FEBRUARY 2018 – 30th JUNE 2018

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Ahmad Fazri Bin Kamarul Zaman

2015115645

Date of submission: 12th July 2018

ABSTRACT

Abstract: *The special project is created based on the problem that has been observed since trainee started the industrial training from 1st February 2018 until 30th June 2018 in Health Information Management Services (HIMS) at KPJ Pahang Specialist Hospital. Trainee has been placed at HIMS under supervision of Miss Tengku Rusidah Binti Tuan Long and she is HIMS Officer that is responsible for the HIMS Department. After that, trainee has been assigned to observe the work process in the department because HIMS is one of the important clinical support departments in the hospital because they need to maintain the patient records or they called it as 'folder'. After a month, trainee has determined the problems faced by HIMS Staffs that affected others department such as missing folder, folder cannot be trace by staff when other departments request for the folder. After that, medical report staff always late in calculating the statistics for the completed medical report that they must submit to operation manager every month. So trainee has decided to develop one system named as Meditouch System that can assist staff in tracking the folder and track all medical report requested and able to generate the report from the medical report. The current manual system are not effective because they only wrote it into the paper if there any request for the folder from clinic and same goes to the medical report. Throughout the industrial training, trainee is able to improve skills in communication especially when need to face the patient, learn the new working environment and apply all the theories that has been learning during studies. The industrial training session is going well until the end and the staff in KPJ Pahang Specialist Hospital gave a very good cooperation to the trainee during the industrial training.*

Keywords: *Medical Records, Medical Records System, Health Information Management Services, Medical Report, Lawyer Case*

ACKNOWLEDGEMENT

First of all, I would like to express my grateful to Allah s.w.t for all the blessings throughout the industrial training program. After that, I would like to record my gratitude to KPJ Pahang Specialist Hospital for accepting me as practical student for 5 months, and industrial supervisor, Miss Tengku Rusidah Binti Tuan Long for her supervision as well as giving the extraordinary experiences through the work from the start until the end of the industrial training program. Thank you to all staff at KPJ Pahang Specialist Hospital for the opportunity and knowledge that had been shared.

Besides that, thank you to Miss Nurul Annisa Binti Abdullah, the person who struggle very hard from the very first thing related to industrial training program and has become supportive faculty supervisor. Thank you for giving a knowledge and idea for the special project and always support me in finishing the industrial training.

Where would I be without my family so, many thanks go in to my parents and family who has always been there whenever I need them, the encouragement they give to keep us going and their love to empower me that never fails all the time. And last but not least, I would like to thank my friends who are always there when I need some help and inspiration.

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1.1 Background of Organization

KPJ Healthcare Berhad ('KPJ' or 'the Group') is Malaysia's leading provider of private healthcare services. Since its introduction of the first private specialist hospital in Johor in 1981, the Group has been at the forefront of the healthcare industry and has become number 1 top healthcare services provider. Driven by its core values of Safety, Courtesy, Integrity, Professionalism and Continuous Improvement, KPJ's integrated network consists of more than 25 specialist hospitals located throughout the nation.

KPJ Group has expanded their business abroad with providing two hospitals in Indonesia. In addition, KPJ has investments in a retirement and age-care resort in Australia and in Sibu, Sarawak, as well as its own Senior Living Care (SLC) centre in Tawakkal Health Centre (THC) in Kuala Lumpur. KPJ's competitive advantage lies in its extensive reach and presence in the highly competitive private healthcare industry. With its hospitals located in various parts of the nation, the Group's hospitals are easily accessible and offer a diverse range of medical specialist services, many of which are major firsts in the nation's healthcare industry. KPJ's also providing the latest technology in healthcare industry to ensure the customer is satisfied with the services.

Apart from clinical technology located in its hospitals, KPJ is also exploring opportunities to apply digitalized medical technology in everyday life. Among the ventures in the pipeline are KPJ's E-Pharmacy with online ordering, wearable technology, robotics, Artificial Intelligence (AI) and the Internet of Things (IoT). KPJ became the first provider of private healthcare services in Malaysia to implement the 'Watson for Oncology' technology for cancer patients. 'Watson for Oncology' is a cognitive computing platform developed by IBM Watson that

facilitates oncologists in their efforts to design treatment plans and evidence-based cancer treatment options for each patient.

One of the KPJ Group that I have completing my industrial training is KPJ Pahang Specialist Hospital (KPHG). KPJ Pahang Specialist Hospital is the second hospital in East Coast under the flagship of KPJ Healthcare Bhd. KPJ Healthcare Berhad, a wholly owned subsidiary of Johor Corporation. Its staff strength stands at 400 employees supported by medical services provided by 24 resident medical and surgical Consultants specializing in various disciplines such as Anaesthesiology, Cardiology, and Ear, Nose & Throat (ENT). To support the consultant practice, KPJ Pahang is also equipped with facilities such as Pharmacy, Laboratory, Cathlab/ Angiogram, 64 Slice CT Scanner, MRI, Ultrasound.

KPJ Pahang becomes the first private hospital in East Coast with Cathlab Facility able to perform angiogram, angioplasty and stenting. KPJ Pahang has embarked into enhancing its information system with the introduction of KPJ Cloud computing that managed several sub systems, namely as Picture Archiving & Communication System (PACS), Hospital Information System, Laboratory Information Management System, Clinical Information System and Tele Radiology. KPJ Pahang just moved into new building and change their name to "KPJ Pahang" in year 2016 and before this their building are located at Alor Akar, Kuantan since year 1986 and the company name is Kuantan Specialist Hospital (KSH). KPJ Pahang has complied with the personal data protection principles under the Personal Data Protection Act 2010 (PDPA) to protect patient data because it is confidential. Since 2016, KPJ Pahang has moved at strategically location in the new commercial hub of Tanjung Lumpur along Jalan Dato' Abu Bakar about 1.5 kilometers from Kuantan town center. It is expected to serve over 600,000 populations in Kuantan as well as those from neighbouring states such as Terengganu.

1.2 Board of Director (BOD) KPJ Pahang Specialist Hospital

BOARD OF DIRECTOR – KPJ PAHANG SPECIALIST HOSPITAL

	DIRECTOR	DESIGNATION
	TN HJ MOHD JOHAR ISMAIL	Chairman
	TN HJ MOHD NASIR MOHAMED	Executive Director
	DATO' DR.NGUN KOK WENG MBBS (Mal), FRCS (EDIN), FRCS (GLAS)	Medical Director

Figure 1.1: Board Of Director KPJ Pahang Specialist Hospital

BOARD OF DIRECTOR- KPJ PAHANG SPECIALIST HOSPITAL

	DIRECTOR	DESIGNATION
	DATO' HJ. KHALED MAT HASSAN A.AP MD (UKM), DObstRCP (IRE), MRCOG (UK)	Members
	DATO' MOHD KHAIRUDDIN HJ ABDUL MANAN	Members
	EN MOHD AZMAN SA'AD	Members

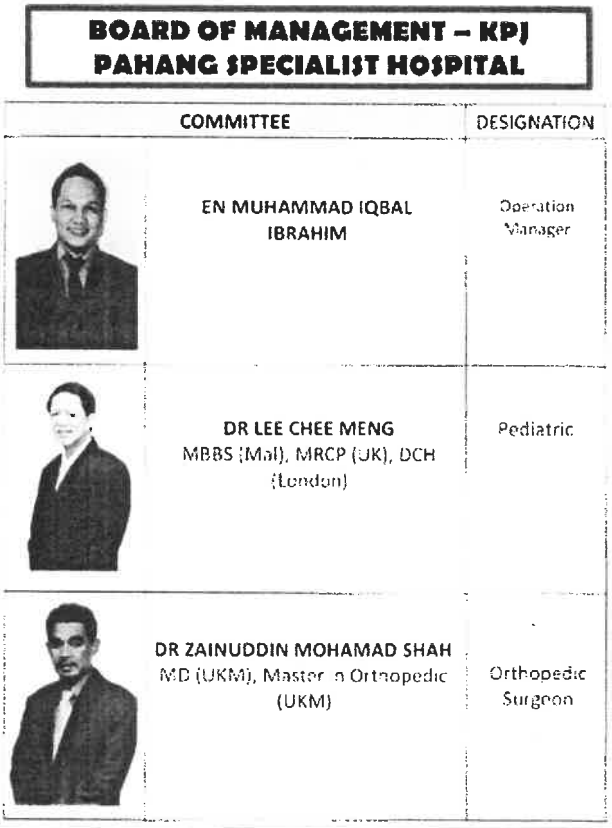
Figure 1.2: Board Of Director KPJ Pahang Specialist Hospital

1.3 Board of Management (BOM) KPJ Pahang Specialist Hospital

BOARD OF MANAGEMENT – KPJ PAHANG SPECIALIST HOSPITAL

	COMMITTEE	DESIGNATION
	TN HJ MOHD NASIR MOHAMED	Executive Director – Chairman BoM
	DATO' DR NGUN KOK WENG MBBS (Mal), FRCS (EDIN), FRCS (GLAS)	Medical Director
	TN HJ YASSER ARAFAT ISHAK	Chief Executive Officer

Figure 1.3: Board Of Management KPJ Pahang Specialist Hospital



BOARD OF MANAGEMENT – KPJ PAHANG SPECIALIST HOSPITAL

	COMMITTEE	DESIGNATION
	EN MUHAMMAD IQBAL IBRAHIM	Operation Manager
	DR LEE CHEE MENG MBBS (Mal), MRCP (UK), DCH (London)	Pediatric
	DR ZAINUDDIN MOHAMAD SHAH MD (UKM), Master in Orthopedic (UKM)	Orthopedic Surgeon

Figure 1.4: Board Of Management KPJ Pahang Specialist Hospital

BOARD OF MANAGEMENT – KPJ PAHANG SPECIALIST HOSPITAL

	COMMITTEE	DESIGNATION
	MR ERIC SIM KAM SENG	Member
	PN ZALINA OSMAN	Member
	EN ROSLAN ABDUL MUTALIB	Member

Figure 1.5: Board Of Management KPJ Pahang Specialist Hospital

BOARD OF MANAGEMENT – KPJ PAHANG SPECIALIST HOSPITAL

	COMMITTEE	DESIGNATION
	EN AHMAD ADLI KAMARUZAMAN	Finance Manager
	MDM TAN MEI LI	Chief Nursing Officer

Figure 1.6: Board Of Management KPJ Pahang Specialist Hospital

1.4 Hospital Organization Chart

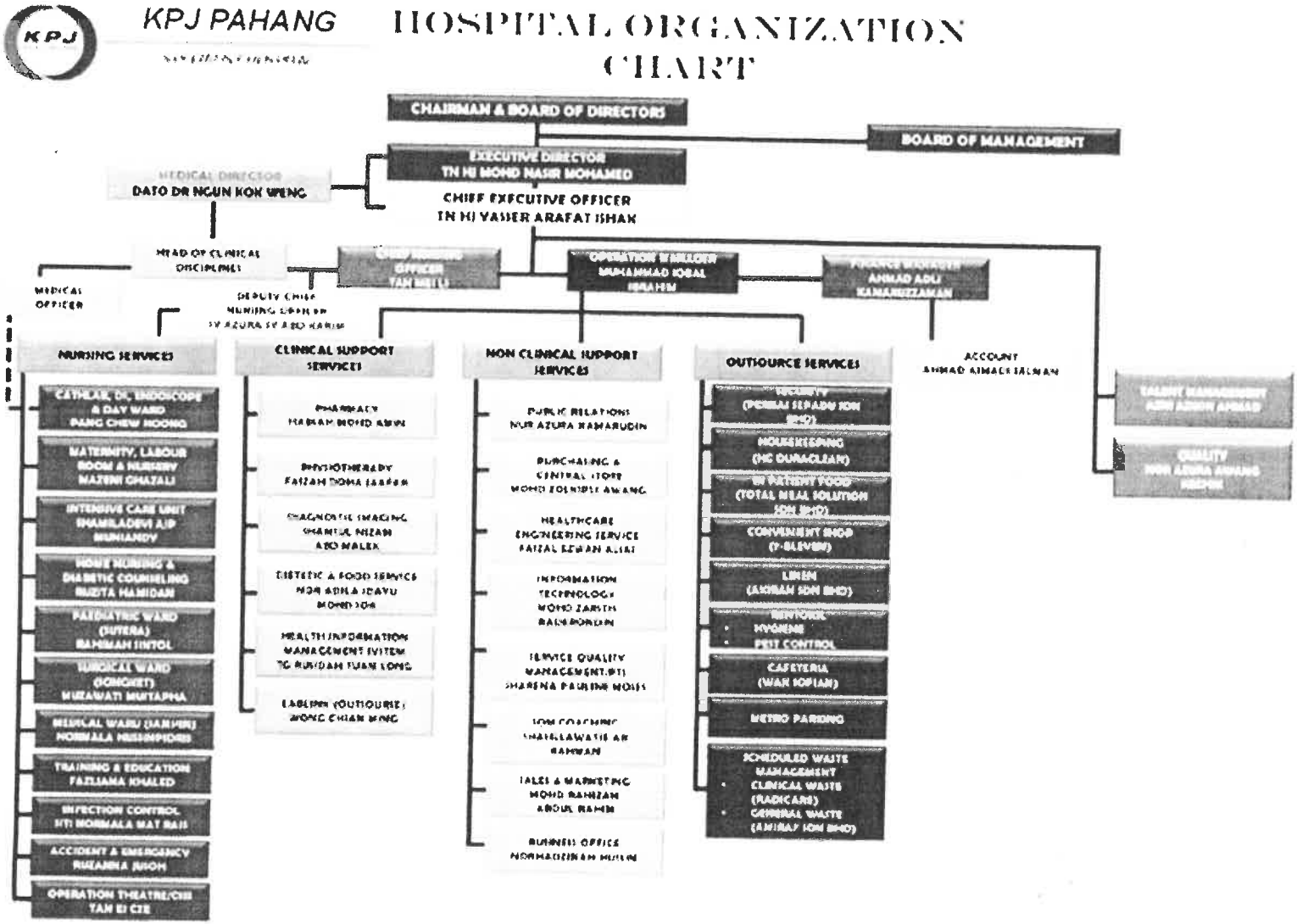


Figure 1.7: KPJ Pahang Specialist Hospital Organization Chart

1.5 Resident Consultants at KPJ Pahang Specialist Hospital

RESIDENT CONSULTANT – KPJ PAHANG

	CONSULTANT	DISCIPLINE
	**DATO' DR.NGUN KOK WENG** MBBS (Mal), FRCS (EDIN), FRCS (GLAS) ***MEDICAL DIRECTOR*** Date Joined: 1 December 1986	General Surgery
	**DR. LEE CHEE MENG** MBBS (Mal), MRCP (UK), DCH (London) Date Joined: 1 December 1986	Paediatrics
	**DATO' DR. P. RAJAGOPAL** DIMP MBBS (Mal), AM (Mal), FRCP (G), M Sc OHS (EDU-AUS) Date Joined: 1 April 1987	Cardiology & Internal Medicine
	**DATO' DR. GOH BOON HUAT** DIMP MBBS (Mal), FRCOG (London) Date Joined: 4 July 1990	Obstetrics & Gynaecology

Figure 1.8: KPJ Pahang Specialist Hospital Consultants

RESIDENT CONSULTANT – KPJ PAHANG

CONSULTANT		DISCIPLINE
	**DR. YONG TENG CHOY** MBBS M.S. ORTHO (UKM) Date Joined: 10 April 1992	Orthopaedics & Trauma Surgery
	**DR. HJ. KHALED MAT HASSAN** A.AP MD (UKM), DObstRCP (IRE), MRCOG (UK) Date Joined: 1 January 1994	Obstetrics & Gynaecology
	**DR. SURAYA ARSHAD** AMZ MBBS (Mal) M.Med. O&G (UKM) Date Joined: 15 January 2001	Obstetrics & Gynaecology
	**DATO'DR. TAN KIEN** D.IMP,AMP MD (Mal), M.Med(S'pore), MRCP(UK) Date Joined: 15 December 2001	Cardiology & Internal Medicine

Figure 1.9: KPJ Pahang Specialist Hospital Consultants

RESIDENT CONSULTANT – KPJ PAHANG

CONSULTANT		DISCIPLINE
	**DR. ZAINUDIN MOHAMAD SHAH** MD (UKM), M.S. ORTHO (UKM) Date Joined: 1 January 2002	Orthopaedics & Trauma Surgery
	**DR. KULJEET SINGH** MBBS, FRCP, FFRRCS Date Joined: 11 February 2003	Radiology
	**DR. HUZAIMI YAAKOB** MBBS (Ma), M.S GEN.SURGERY (UKM), FRCS (IRE) Date Joined: 1 January 2004	General Surgery
	**DR. SRINOVIANTI NOERDIN** MD(UKM), MS ORL (UKM) Date Joined: 1 September 2004	Ear, Nose & Throat Surgery

Figure 1.10: KPJ Pahang Specialist Hospital Consultants

RESIDENT CONSULTANT – KPJ PAHANG

CONSULTANT		DISCIPLINE
	**DR. KHAIRUL MUHSEIN ABDULLAH** MBBCh (Ire), MSURG (UKM), AM (Mal) Date Joined: 2 June 2008	Neuro Surgery
	**DR. SIVAKUMAR A/L KATHIRAVALE** M.B.B.S (India), M.Med Anaesthesiology (UKM) Date Joined: 1 October 2009	Anaesthesiology
	**DR MOHD ASHRI AHMAD** Mb/ BCh. B.A.O (Ireland) M. Med Anaesthesiology (UKM) Date Joined: 1 June 2014	Anaesthesiology
	**DR NG KOK HUAN** MBBS (Mangalore, India), MRCP (UK) Date Joined: 1 July 2014	Cardiology

Figure 1.11: KPJ Pahang Specialist Hospital Consultants

RESIDENT CONSULTANT – KPJ PAHANG

CONSULTANT		DISCIPLINE
	**DR. MD. LUKMAN MOHD. MOKHTAR** MBBS (UM), M.Med Anaesthesiology (UKM) Date Joined: 1 May 2015	Anaesthesiology
	**DR. AZLIN SA'AT@YUSOF** MBBS (UM), MRAD (UM) Date Joined: 1 July 2015	Radiology
	**DR. NORAZIANA ABD. WAHAB** MBBS (Manipal), M.Med (O&G) (USM) Date Joined: 1 June 2016	Obstetrics & Gynaecology
	**DR. MOHAMED AZRIL MOHAMED AMIN** MBBS (Manipal), M.Med (Ortho) (USM) Date Joined: 15 July 2016	Orthopaedics & Trauma Surgery

Figure 1.12: KPJ Pahang Specialist Hospital Consultants

RESIDENT CONSULTANT – KPJ PAHANG

CONSULTANT		DISCIPLINE
	**DR. RAJA AHMAD AL'KONEE RAJA LOPE AHMAD** MD (UKM), M.SURG. (ORL-HNS)(UKM) Date Joined: 1 June 2016	Ear, Nose & Throat Surgery
	**DR. AHMAD MARDZUKI IBRAHIM** MD(Belgium), Master in Surgery (USM) Date Joined: 1 August 2016	General Surgery
	**DR. YEO HENG BON** MBBS (Mal), MRCP (Paediatrics) (UK) Date Joined: 1 September 2016	Paediatrics
	**DR. TEE HOI POH** MBBS (B'lore), MRCP (UK), AM (Mal) Date Joined: 3 January 2017	Gastroenterology & Internal Medicine

Figure 1.13: KPJ Pahang Specialist Hospital Consultants

1.6 KPJ Pahang Vision, Mission and Core Values

Table 1.0: KPJ Pahang Vision, Mission and Core Values

Vision	The preferred Healthcare Providers
Mission	Delivering Quality Healthcare Services
Value	Ensuring Safety Delivering Service With Courtesy Performing Duties With Integrity Exercising Professionalism At All Times Striving For Continuous Improvements

1.7 Company Details

Table 1.1: KPJ Pahang Details

Name of organization	KPJ Pahang Specialist Hospital (KPHG)
Address	Jalan Tanjung Lumpur, 26060 Kuantan, Pahang
Phone Number	+60 9-5112692
Website	http://www.kpjpahang.com
Business Type	Healthcare Industry

CHAPTER 2: ORGANIZATION INFORMATION

CHAPTER 2: ORGANIZATION INFORMATION

2.1 Health Information Management Services (HIMS) Departmental Structure

Health Information Management Services (HIMS) is one of the clinical support services in KPJ Pahang Specialist Hospital to manage and maintain the lifecycle of medical records. HIMS are operates under Tengku Rusidah Tn Long which is HIMS Officer and she is responsible for the department. HIMS is one of the most important departments because it involves the patient records history that will be used by consultants as the reference sources in the future. The medical records contains the important items such as patient case notes, patient indexes and registers, nursing and wards records, pharmacy and drug records, pathological specimens and preparations and others. All these items need to be manages and handle by HIMS Staff by following the correct standard operation procedures (SOP). The patient records are protected under Medical Records Act 2004. KPJ Pahang Specialist Hospital started their operations in 2016 at Tanjung Lumpur and before the existence of KPJ Pahang, the hospital name is Kuantan Specialist Hospital (KSH) and the building at the Jalan Alor Akar, Kuantan since 1986.

Figure 2.0:HIMS Organization Chart

2.2 Health Information Management Services (HIMS) Function

HIMS is one of the busiest departments because they need to handle the records from two different building which is KPJ Pahang and also Kuantan Specialist Hospital. Since 1986, KPJ still not practicing and implement electronic medical records because they are not aware the importance of electronic medical records. Until today, KPJ Pahang Specialist Hospital already has 42,000 patient records and 250,000 patient records at Kuantan Specialist Hospital and it is arranged by using running block number. If there are too many paper records, it will increase the cost because they need to expand the space to store the medical records.

HIMS already has 11 staffs includes HIMS Officer and all 11 staffs has different position based on the job scope and in future HIMS will add one new position that are called as Medical Records Nurse that are responsible to read the patient case note for the coder. HIMS staff is working by divided from 8.30am until 5.00pm and also there are 3 shifts every day which is morning, evening and night. The working hours for shift such as below:

1. Morning - 7.00am – 2.00pm
2. Evening - 2.00pm – 9.00pm
3. Night - 9.00pm – 7.00pm

The shifts will be rotate between HIMS Clerk and the schedule will be prepared by HIMS Officer which is Tengku Rusidah Tuan Long. The shifts will be taken by one staff only at one shifts and there are little different of their job scope. The shifts job scope such as below:

Table 2.0: Shifts Job Scope

SHIFT	RESPONSIBILITY
Morning	a. Pick-up calls from clinic for folder request b. Filing Morning Return Folder and Audit the Morning Return Folder
Evening	a. Pick-up calls from clinic for folder request b. Filing the Evening Return Folder and Audit the Evening Return Folder

Night	a. Get request for folder from Accident & Emergency Department (if any) b. Prepare for the folder based on appointment list for the next day

There are many positions in HIMS because they are responsible for many job scopes. The job scope such as below:

Table 2.1: HIMS Position and Job Scope

POSITION	JOB SCOPE
HIMS OFFICER	Head of Services that is responsible to manage and handle all the operations that involve the medical records, medical report, statistics for medical reports, and also medical records staffs.
MEDICAL REPORT STAFF	Medical report staff is responsible to handle the medical report requested by patient, agent or lawyer for them to make a claim. There are flows they need to follow in preparing the medical reports for client and they have Key Performance Indicator (KPI) need to be achieved which is 75% of medical reports is prepared within 2 weeks.
INPATIENT CODER	Inpatient Coder is responsible to create a coding for every medical records based on the format provided in ICD-10. The coding will be based on the type of diseases infected by inpatient.
HIMS CLERK	HIMS Clerk is responsible to pick up calls from consultant suites, wards, and other user of medical records for them to get the medical records needed. Mostly they are taking the folder by getting the Medical Records Number (MRN). HIMS Clerk also are responsible for porter the folder to the consultant suites, filing the folder and make a notifications if there are contagious diseases to Ministry of Health (MOH).

2.3 INFORMATION TECHNOLOGY SERVICES

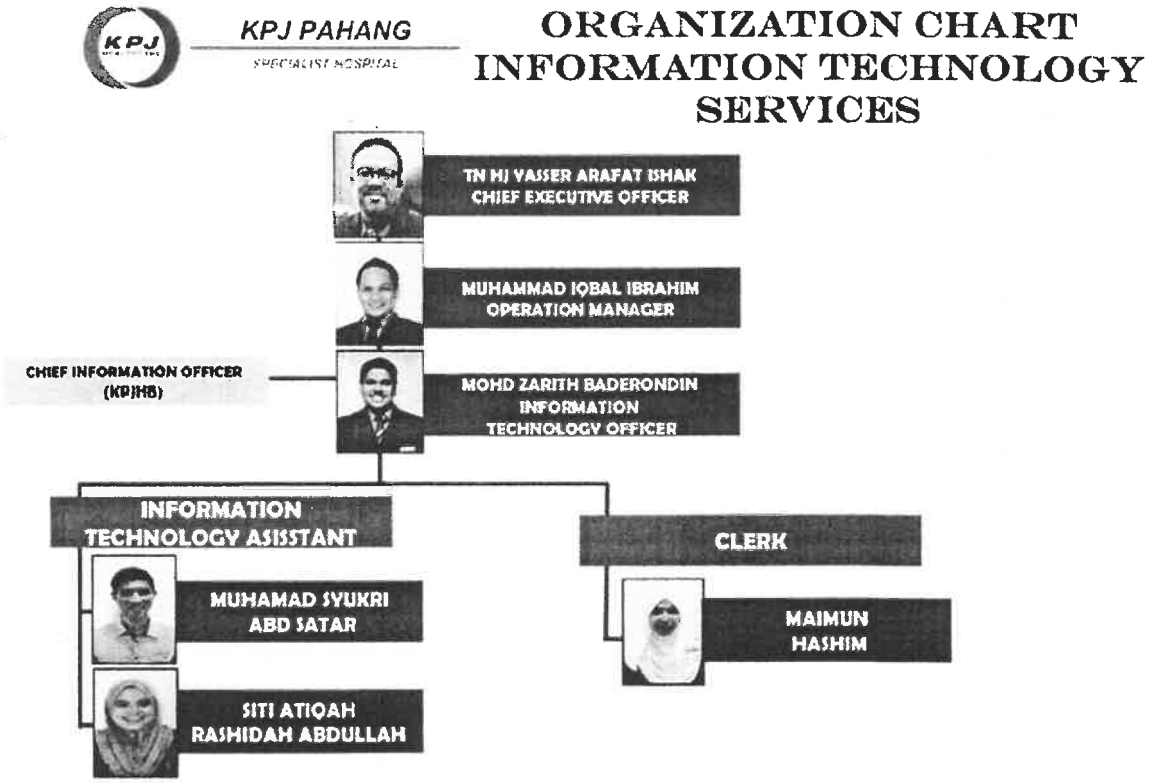


Figure 2.1 Information Technology Organization Chart

Information Technology Services (IT) is one of the non-clinical support services that are on important in KPJ Pahang because they are responsible to maintain all the existing system and information technology infrastructure such as computer, laptop, projector, ID Band Printer, Que Management System (QMS), Printer and others. Besides that, IT will provide the infrastructure such as laptop and projector to the other services if they would like to organization an event. IT Services in KPJ Pahang are not involved in system development because current systems they are using outsource and IT Staff only maintain the system. In KPJ Pahang Specialist Hospital, IT Services only have 6 staffs includes Head of Services. The working hours such as below:

Table 2.2: IT Services Working Hours

DAY	TIME
Monday-Friday	8.30AM-5.00PM
Saturday	8.30AM-12.30PM

Every Weeks, the IT Staff will rotate for on call if there are emergency occur such as system breakdown, internet connection problem and others. All staffs in IT Services have different responsibility and they have been divided according to the job scope. The Job Scope such as below:

Table 2.3: IT Services Job Scope

POSITION	JOB SCOPE
IT OFFICER	Head of Services that is responsible to manage and handle all the operations that involve the information technology and build a good relationship with vendor.
IT ASSISTANT	IT Assistant is responsible in handling and maintaining the system, infrastructure and also server room in KPJ Pahang.
IT NURSE	Give training to medical department regarding IT and train new Doctor or Consultant about the MedCare System.
IT CLERK	IT Clerk is responsible to maintain the system, waiting for call if they are problem in other department for the system or IT infrastructure.

CHAPTER 3: INDUSTRIAL TRAINING ACTIVITIES

3.1 Training Activities

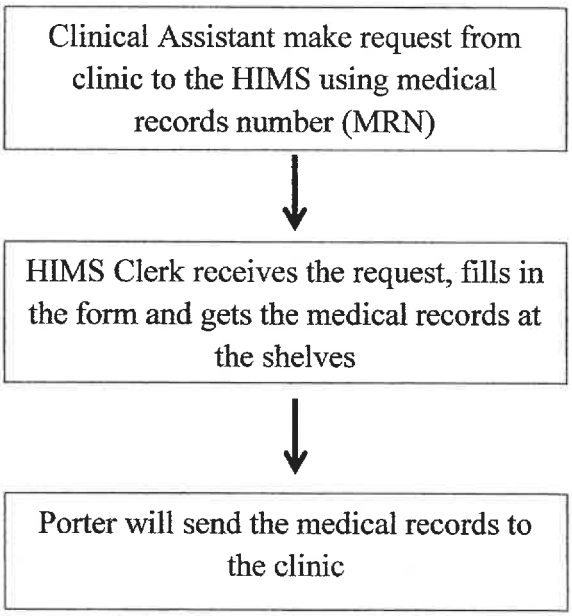
During the internship, trainee has been exposed to many type of work in Health Information Management Services (HIMS) and also Information Technology Services (IT). All the task given are suitable with trainee programs during studies and from the task, trainee are able to learn the real working environment and gain new experience while working with professional staffs in KPJ Pahang. Besides that, the task given to trainee will be guide by the staffs and they will teach the trainee if trainee is not capable to complete the task.

3.1.1 Medical Records Management/Keeping

During internship at Health Information Management Services (HIMS), trainee has involves in managing the medical records that is very important because it involves the patient of KPJ Pahang records and data. The medical records are protected under Personal Data Protection Act (2010) and the level of classification for the medical records is confidential. The medical records cannot be brings outside of the hospital building and it will be taken out from shelf if there are request from consultant clinics only.

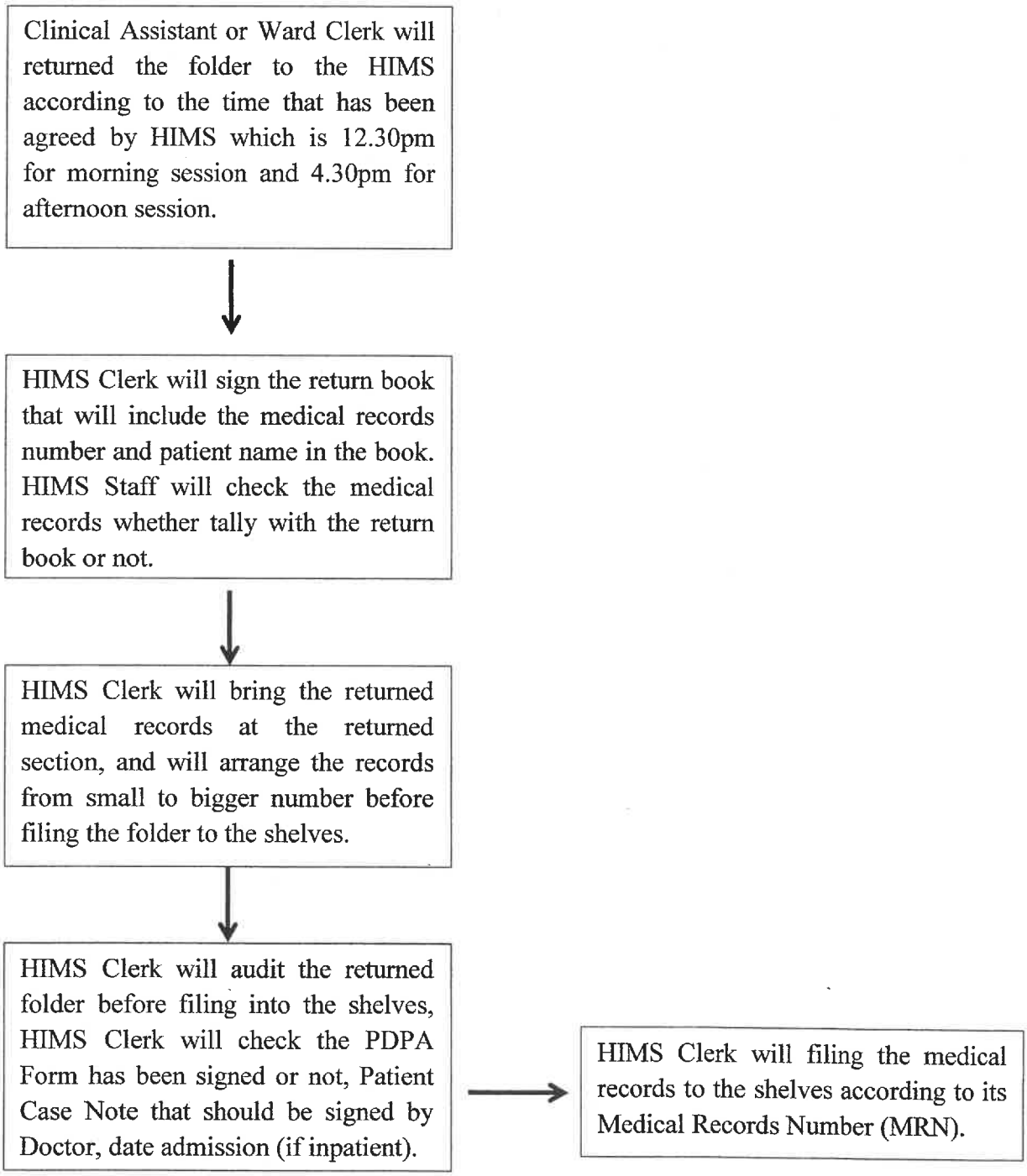
3.1.1.1 Medical Records Porter

The medical records already hired a HIMS clerk in order to porter the folder if there are request from the consultant suites, health screening, medical officer and others. The process such as below:



3.1.1.2 Medical Records Filing

The medical records are arranges using running block number that contains 8 digit of numbers starting from 00000001 until current numbers. There is procedure in order to filing the medical records. The shelves in medical records have been divided into alphabet which is A-L to make them easier to retrieve and filing the medical records. The medical records will be filing when the medical records folder has been returned to HIMS from clinic or wards. There is flow need to be followed in order to filing the medical records into the shelf. The flow such as below:



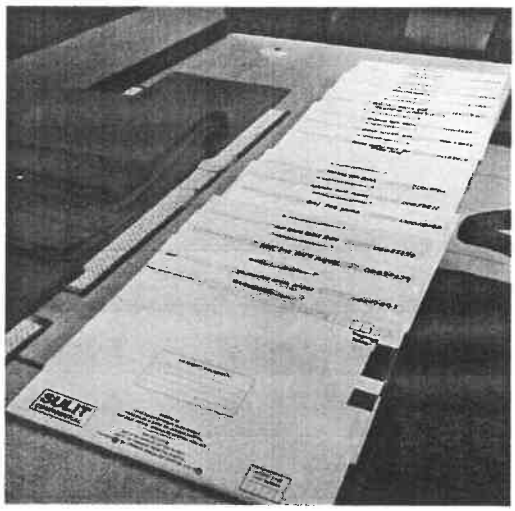


Figure 3.0 Folder are arranged from smaller into bigger number before filing

Figure 3.1 Folder are returned from consultant clinic

3.1.1.3 Medical Records Clerk

Trainee has been given the opportunity in order to handle the medical records request from the clinic or ward. The request will be made by using the telephone and the trainee will write the medical records number (MRN) into the request book. After that trainee will get the medical records at the shelf and put the medical records at the porter section. Porter will send the medical records within 30 minutes from the time requested.

3.1.1.4 Coding

The trainee has learned about the coding for the medical records by using the International Statistical Classification of Diseases and Related Health Problems (ICD-10) as references. The coding has been teaches by the only one HIMS Coder, which is Puan Rahmah. Coding will be made based on patient case note because at the case note the doctor will write the diseases that infected the patient. The coding will be writing at the patient case note and will be key-in into Med Care System. The example of ICD-10 coding such as below:

Table 3.0: Example of ICD-10 Code

CODE	DISEASES
S10.9	Superficial injury of neck, part unspecified
S90.01	Contusion of toe(s) without damage to nail
I11.0	Hypertensive heart disease with (congestive) heart failure

3.1.1.5 Attend Courses & Training

For a student that conducting industrial training at KPJ Pahang, it is compulsory them to attend training such as Standard People Practices Training, Monthly Assembly, Induction Courses, Infection Control Courses. Because all this training is to expose the students all activity involves in Hospital and to teach students how to face the

patient at Hospital. Mostly the training are organize for two days and student are compulsory to attend the training.

3.1.1.6 Innovation for 5S

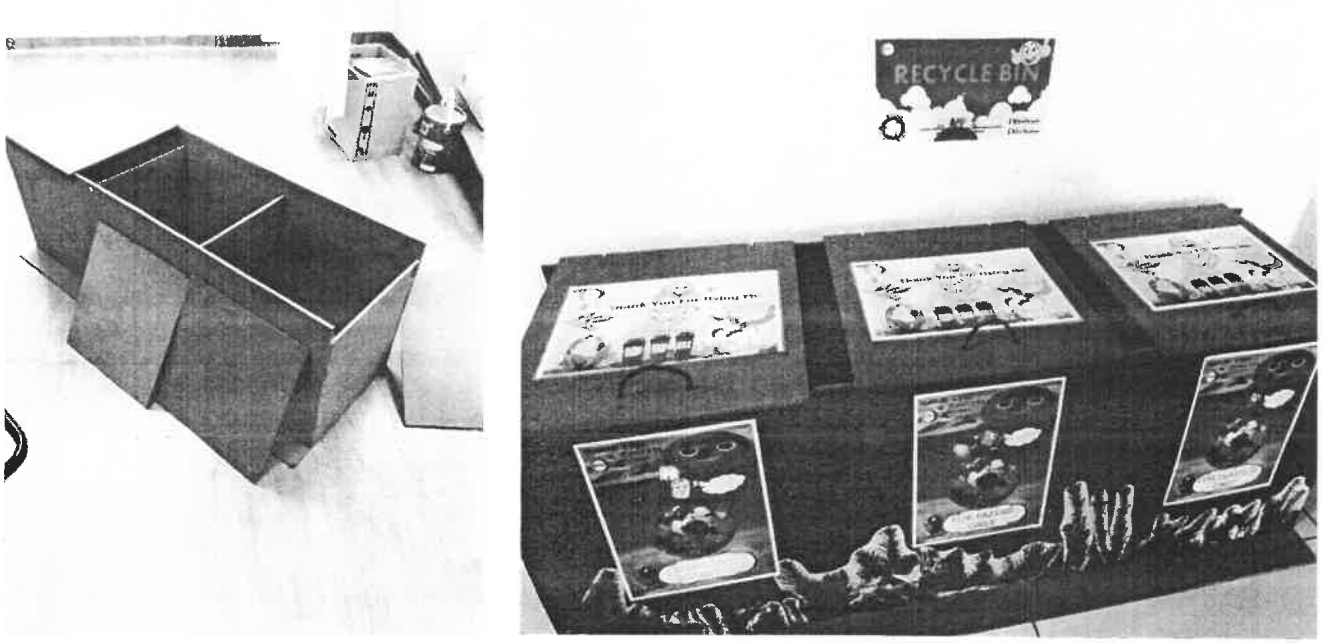


Figure 3.2: Recycle Bin Created Using Recycle Plywood

The innovation idea from the trainee and propose to the HIMS Officer as innovation project for the 5S. The recycle bin are created using plywood that are not used by the Hospital and the trainee have the permission from Chief Executive Officer which is Tuan Haji Yasser Arafat Ishak to use the plywood for innovation project.

3.1.1.7 Folder Disposal

Figure 3.3: Folder Disposed from Kuantan Specialist Hospital

The folder disposal is the daily activity conducted by trainee at the old hospital building which is Kuantan Specialist Hospital (KSH) because they has a lot of paper medical records at the KSH and the total medical records at KSH is 250,000 medical records that are maintained since 1986. This is the first time for KPJ Pahang conducting the folder disposal with the advice from Medical Records Committee of KPJ Pahang Specialist Hospital. The folder disposal duration is one month started from 1st April 2018 until 29th April 2018 and around 8,000 of medical records has been disposed from Kuantan Specialist Hospital.

3.1.1.8 Medical Report Claim

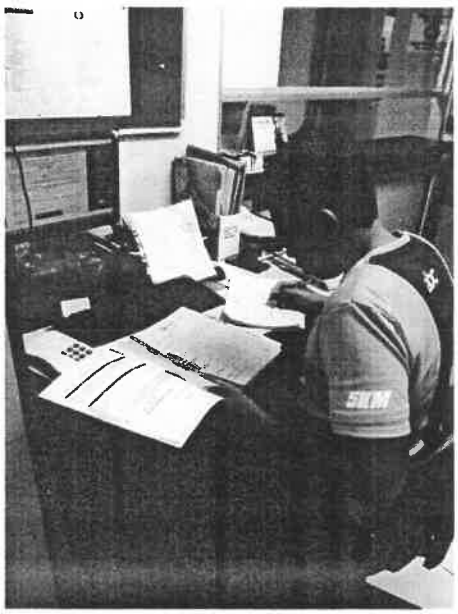


Figure 3.4: Handling Patient Medical Report Claim

The medical report is one of the products of KPJ Pahang because patient requires paying the medical reports if they would like to request one. Medical Reports are requested by patient for them to claiming the compensation from insurance company or the lawyer case. The price of specialist medical report is not same because it is depends on consultants on how much to charge for the medical reports. But the normal report is only 150.00MYR. Usually the medical reports will completed by consultants 2 weeks after the medical reports being requested and sometimes it takes a long time.

3.1.1.9 Laptop and Personal Computer Maintenance

In KPJ Pahang Specialist Hospital, there are more than 300 personal computer need to be maintained by Information Technology (IT) Staff and staff must conduct preventive maintenance for all personal computer at least 1 personal computer a day. The personal computer (PC) still has warranty from Lenovo and if problems occur in hardware or software, IT Staff are responsible to lock case to the Lenovo Centre and the staff from Lenovo will come to solve the problems. But in KPJ Pahang, there are some staffs still using the old PC and need to be maintained by IT Staff.

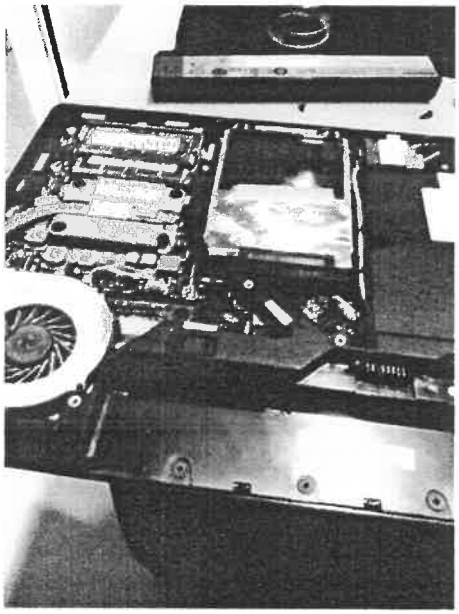


Figure 3.5: Cleaning Staff Laptop

3.1.1.10 Setup New Personal Computer for New Consultant Suites

At KPJ Pahang Specialist Hospital, there still unoccupied room for new consultant in the future. If there are new consultant, trainee and IT Staff should setup the network, Personal computer for consultant and clinical assistant, and software and system for the Personal computer. The consultant will be provided with All-In-One PC, Lenovo brand to make them comfortable in using the PC.

3.1.1.11 Network Problems

At KPJ Pahang Specialist Hospital, they have their own local server room from SangFor brand and every level of the hospital they have COMROOM. The COMROOM and server room and maintain by trainee and IT Staff. Sometimes, there are internet connection problem occur at the hospital and IT Staff must reboot or reset the connection. The connection must be reset at the COMROOM according to the level of the internet problems occurs. It is because the network is using Power Over Ethernet (POE) as the switch for the router.

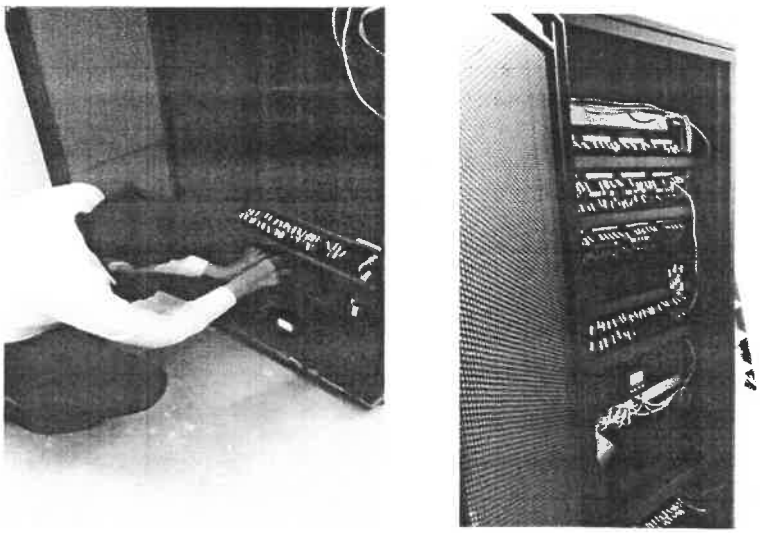


Figure 3.6: Reset the Server

3.1.1.12 Multimedia For Commercial and Marketing

IT Staffs also responsible for the recording and editing of video for the marketing of the hospital. They are using facebook, website and instagram for marketing of the Hospital. IT Staff will create the video and edit the video before publish into the social media and most of the video is advices from the consultants.

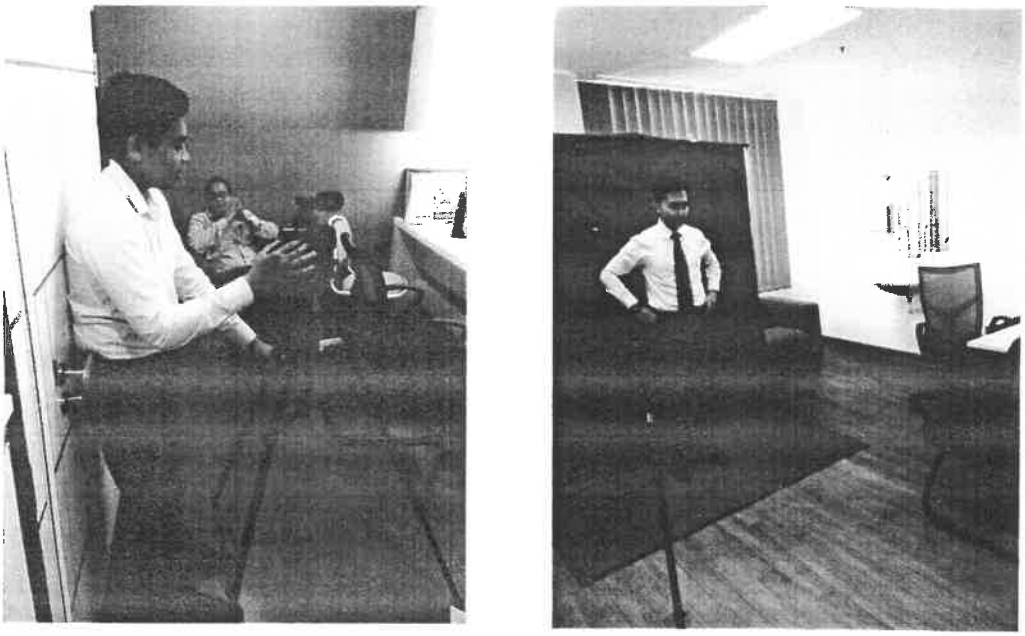


Figure 3.7: Video Recording

3.1.1.13 Android Application Development

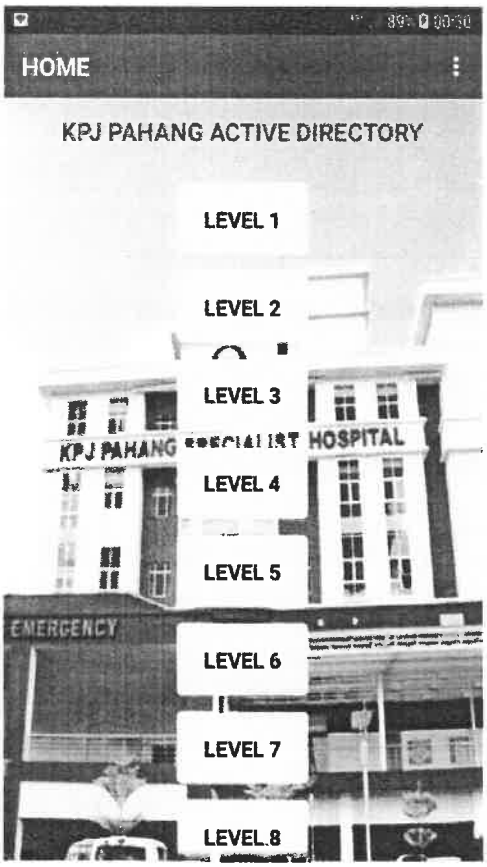


Figure 3.8: Android Apps Home Page

3.1.1.13 Android Application Development

The android apps are developed by trainee using MIT Apps Inventor 2. The application is for the staff to search the telephone directory for the whole building of Hospital from level 1 until level 8.

3.2 Special Project

3.2.1 Introduction to the Client Department

Health Information Management Services (HIMS) is one of the support services in KPJ Pahang that maintain and handle the management of Patient Folder. From 2016 until 2018, there are 40,000 patient folder need to be maintained in KPJ Pahang and 250,000 patient folder need to be maintained in Kuantan Specialist Hospital (KSH). HIMS are responsible to provide the folder to their user which is 22 consultant suites and 4 ward. Medical Records Officer which is Tengku Rusidah Tn Long already has 11 staff that handle the coding for the folder, medical report and others is clerk. HIMS must ensure the folder can be retrieved by user within 30 minutes after time requested. Besides that, HIMS also responsible in processing the medical report if patient would like to do a claim from insurance. HIMS also are responsible in order to notify the infectious diseases to Ministry of Health (MOH). Until 2018, HIMS only using the MedCare system to check the registered patient whether inpatient or outpatient.

3.2.2 Project Title

I have decided for the title of the system which is MediTouch System

3.2.3 Executive Summary of the System

MediTouch System is one of the project to be develop for Health Information Management Services (HIMS) KPJ Pahang in order to solve the current issues faced by the staff in their daily work process. According to (Pappas, 2016), "most of organization in these days still not practicing the use of online system to improve their work process" because most of the staff do not has skills in information technology and that is the main reason why the organizations still using the paper. In the MediTouch, the system provides three system modules which is Folder Request Modules, Medical Report Tracking and Folder Tracking Modules. The modules will assist and helps staff in HIMS to improve their work process becomes more effective and efficient and reduce time in tracking the folder. Folder Request Modules will be used by Clinical Assistant (CA) in Consultant Suites and also HIMS clerk. CA will key-in the medical records number in the system and the number will be appear in the HIMS clerk screen to notify them there are folder request from the CA. It is more efficient rather than current method use which is telephone. The use of telephone can affected the ear and causes the ear problems because average total for the folder requested every day is 120 folder and

that is the total of HIMS clerk need to pick up the phone. By using the system, it will minimize the use of telephone and HIMS clerk are able to fully utilize the use of personal computer in the office. After that, the next modules is Folder Tracking System. The user of Folder Tracking System is only HIMS staff. Folder Tracking System will be used to expedite tracking the folder location because there are many folder lost at HIMS and cannot be traced where is the last location. Currently, the outgoing patient folder will be recorded in the book, but sometimes staff are not record the outgoing folder and that is the reason why the folder cannot be traced. The last modules is Medical Report Tracking Modules that are able to track the status of medical report whether completed or not by staff. MediTouch will assist the staff in HIMS to reduce time consuming in every work process involved at HIMS.

3.2.4 Problem Statement

3.2.4.1 Needs

MedTouch System is developed because of "demands by a user to help them in managing and arranging the folder in Health Information Management Services (HIMS) become smooth and to reduce time taken for HIMS client to request folder. HIMS need to serve the patient folder within 30 minutes after time request from HIMS user. Before this, HIMS are using the traditional method in requesting and tracking the folder. MedTouch will reduce as much as possible the problem that faced by HIMS staff. Those problems are:

1. Time-consuming to trace the folder
2. Obsolete manual system
4. Clinical Assistant and Ward are requesting the folder using the telephone
5. Patient Folder are missing and cannot be traced

3.2.5 Objective

The objective of the MedTouch system are:

- To ensure HIMS client are able to retrieve the folder in a short period of time
- To minimize the loss of folder
- Staff are able to create statistics from medical report

3.2.6 Scope of the Project

The scope of the system is about shifting the traditional ways of requesting the folder in the HIMS into more systematic and faster ways. The system will provide three modules such as folder request module, medical report tracking modules and also folder tracking module to ensure the folder can be deliver to the right person at the right place in the right time. The system will be develop using Preprocessor HyperText (PHP), Cascading Style Sheet (CSS), Ajax Jquery and also MySQL Databases platform.

3.2.7 Target User

There are two target user which is Health Information Management Services (HIMS) staff and also Clinical Assistant (CA). HIMS staff are responsible to manage and monitor the patient folder effectively. Using MedTouch, Clinical Assistant are able to reduce time consuming in order to request to folder needed. HIMS staff also are able to track the movement of the folder because currently there are manual tracking system but it is obsolete.

3.2.8 Tool Used for Development

In order to make the development process more effective, the high quality software development tools. There are many software can be used for the development process and most of the software is open sources software.

NAME	DESCRIPTION
	Php is one of the programming languages that are used in order to create the web system. It can be connected with HTML and other programming language such as C, C++, and so far, PHP is the most suitable language can be used for system development. "**Preprocessor Hypertext**"

	It is one of the language used for database management system. Every data are stored in database and there are many types of database such as Oracle. "**MySQL**"
	WampServer is a Windows web development environment. It allows you to create web applications with Apache2, PHP and a MySQL database. It also comes with PHPMyAdmin and SQLiteManager to easily manage your databases. "**WampServer**"

3.2.9 Planning Phases

3.2.9.1 Assessing Project Feasibility

In developing the new system, any feasibility should be considered before started the project and it should be considered in terms of cost and budgeting, time consuming, hardware and software and many more. According to (Mukund, 2012), "a feasibility study involves taking a judgment call on whether a project is doable. The two criteria to judge feasibility are cost required and value to be delivered". Project feasibility should be considered just in case there are problems faced when the process of system development occur in especially when it is in the middle of the projects. Project feasibility will produce a good project management. Proper planning should be done by the team that will run this project.

To ensure the project is running smoothly, I will have a discussion with lecturers and HIMS staff in order to collect other information related with the system that will be developed. There are problems faced by HIMS staff in managing their main functions such as provide folder requested from clinic, handle and maintain the folder. HIMS staff can help in giving cooperation because once the system are completed, they will used it. And their recommendation will help us to improve the system from day to day

until it finished and the estimate time to finish this system is 5 months start from Febuary 2018 until June 2018.

3.2.9.2 Assessing Economic Feasibility

In developing the system, it is important to analyze the economic feasibility which is identify the financial benefit and cost related with a project development. According to (Mukund, 2012), "helps organizations assess the viability, cost, and benefits associated with projects before financial resources are allocated. It also serves as an independent project assessment, and enhances project credibility, as a result". This is to ensure that the process in developing the system will not overdue especially in the middle of the process. During the project initiation and planning it is important to identified accurately all the benefits and cost that are associated with the selected projects. It is important to spend time accurately to identify all the materials needed for the project that includes everything such as hardware, software, cost, benefits, and also problems that will be faced in economic and if not I will faced the problems to bearing an acceptable economic analysis.

3.2.9.3 Assessing Technical Feasibility

Technical feasibility is a process of assessing the development organizations ability to constructed a propose system. Every organization that would like to develop the system must consider about the project size, structure, development group and user group. To ensure that the risk can be overcome when there are problems happen in the future.

3.2.9.4 Assessing Schedule Feasibility

Project timeframe must be planned properly in order to overcome overdue of the project planning. Profit of the organization is important to ensure the company will always effective and efficient with financial management so to ensure that is by making the schedule properly. "The project timeline is the beating heart of every project. It captures the essence of what the project will accomplish and how it will be done. Knowing how to create a project timeline is one of the most essential skills a project manager needs to develop in the early stages of his or her career. Building comprehensive, accurate timelines will help you get every project off on the right foot" (Bunner, 2016).

3.2.9.5 Project Costing

In order to finish this system, the calculations had been made that includes the cost of software and hardware used for the system development from April until December 2017. The purpose of doing project costing is to ensure that there are no over budget will occur in the future. The budget calculate by using Malaysia Currency which is Ringgit Malaysia (RM). According to (Bunner, 2016), "Project cost estimating scares a lot of people. They don't know how much something will cost, but they know whatever value they give, they will be held to it by their manager" and that is the reason why I need to consider the project costing.

Maintenance

Table 3.1: Total Budget for Project Maintenance

No	Others	Cost	Total Cost (RM)
1	**Maintenance**	**10,000**	**RM 10,000**
	Total Cost (RM)		**RM 10,000.00**

Hardware

Table 3.2: Total Budget for Hardware

No	Hardware	Price per unit (RM)	Quantity	Total Cost (RM)
1	LENOVO MONITOR 16.5" (Black)	RM 400.00	2	RM 800.00
2	LENOVO DESKTOP	RM 700.00	2	RM 1400.00
3	MOUSE	RM 12	2	RM 24.00
4	KEYBOARD	RM 15	2	RM 30.00
5	PRINTER (HP LASERJET)	RM 320	1	RM 320.00
6	INTEL PROCESSOR 2.5 GHZ DUAL CORE	RM 250	2	RM 500.00
7	KINGSTON RANDOM ACCESS MEMORY (RAM)	RM 140	2	RM 280
	TOTAL			RM 3,355.00

Software

Table 3.3: Total Budget for Software

No	Software	Price Per unit (RM)	Quantity	Total Cost (RM)
1	WAMP SERVER	FREE	-	-
2	MICROSOFT OFFICE	RM 600.00	1	RM 600.00
3	NOTEPAD ++	FREE	-	-
4	ADOBE PACKAGE	RM 1298	1	RM 1298
5	MICROSOFT OFFICE	RM 599	1	RM 599
	TOTAL			RM 2,497.00

Table 3.4: Total Estimated Budgeting

No	TYPE	PRICE (RM)
1	SOFTWARE	RM 2,497.00
2	HARDWARE	RM 3,355.00
3	MAINTENANCE	RM 10,000.00
	TOTAL	RM 15,852.00

3.2.10 Significant of the Project

There are many significant compared to using current manual system. It is because the time taken for using the manual method is very long and not productive especially when you need to used it frequently. The significant of the project such as below:

a. No data redundancies occurs in the future
b. Faster time retrieval to track the location of the folder
c. Medical Report Staff are able to update the complete medical report
d. Medical Report Staff are able
e. Improve time taken for medical records staff to respond the folder request from clinical assistant and nurses

3.2.11 Methodology

MediTouch system has become a need to the hospital industry because it will improve the work process for the Health Information Management Services (HIMS) that currently using manual system in every work process. HIMS has request to develop the MediTouch system to help them in improving their management for medical records because they faced a lot of problems by using manual system such as folder cannot be traced, time taken to trace medical report too long and many more. By using this system, staff are able to handle the movement of the folder easily and staff that responsible for medical report are able to trace and create statistics for medical report easily.

In developing the system, PADIM are used as system development lifecycle to ensure the development process running smoothly and system are finished according to time given. PADIM is referred to planning, analyzing, design, implementation and maintenance process that is involved in the system development process. According to (Abul, 2013), "Padim is the most effective method in order to create the system". By using this five phases in system development, I am able to follow the project timeline according to this phases in PADIM and the project are more perfect because the project must follow the phases from planning until maintenance.

Firstly, in planning process I'm conducting preliminary investigation or feasibility study in order to collect all related information needed for the system modules. After that, I had determined the scope of the project which is limited for the hospital industry only. Next, I had identified the resources required for the project and set the timelines to ensure no overdue will happen. In the feasibility study, there are four main important things that I considered, which is project feasibility, economic, technical and schedule feasibility. In project feasibility, I have planned for the system to ensure there are no problems will occur in the future. Economic feasibility is to determine the expense that can be justified by potential financial returns.

Secondly, in the analysis process I have gather all the information required for the project. I had overview the client business area missions and goals. Besides that, I had determined the activities done in completion of tasks. The information gather by using the interview method which is I had conduct an interview with Head of Medical Record Services. I'm also had determined what user need for the system and how it functions. I have conducted interview with staff in Health Information Management Services to discuss what kind of features they

want in the system, and I have collect enough information about the procedures, and how their management in the department. I have understands the workflow of the Health Information Management Services in KPJ Pahang Specialist Hospital which is such as below:

a. Their function is to manage everything that are related with medical records (patient folder)
b. Provide porter to deliver the folder to the consultant suites
c. Notify the Ministry of Health for contagious diseases
d. Coding the patient case note for every disease
e. Prepare medical report for claim from insurance
f. Filing the folder into shelf

Besides that, I have used the literature review method in order to get the information about the existing system. Existing system only provide features for medical report and not related with management because there are no request for the system before. So by using this method, I had found that there are no system like MediTouch before and most KPJ in Malaysia are using manual system also.

Thirdly, in the design process I had determined the technical system configuration to ensure it is meets the user needs. Besides that, I had determined full data structure for the system to ensure the process of the system can run smoothly. I have built the interface of the system and all the diagrams required such as data flow diagram, context diagram and also entity relationship diagram.

Fourthly, in the Implementation process, I've start to code the script for the system by using pre-processor hypetext (PHP), Ajax Jquery, Cascading Style Sheet and Javascript for the whole system. I'm using standard system interface that provides navigation bar, dashboard and sidebar to ensure the system are easy to understand and user-friendly. In my opinion, this phases will spend more time rather than other phases because I can't 'reuse' the coding, because there are no similar system are developed before.

Fifthly, the maintenance process will be done after the system completed and installed into KPJ Pahang local server (10.28.2.55 – SANGFOR) and it will be maintained by Information Technology (IT) Staff. In the maintenance process, IT will perform maintenance activity such as system performance, create monthly report for storage used (from local server) and access system security to ensure data are secure. IT staff will conduct on-going system maintenance

monthly and if there are new features or updates for the system, IT staff are responsible to release the patch update into the local server.

3.2.12 Analysis of the System

3.2.12 Analysis

3.2.12.1 Analyze Existing System

Health Information Management Services (HIMS) KPJ Pahang Specialist Hospital still doesn't have specific online system for medical records tracking and medical reports. Currently there only traced the folder on the form that they fill when the folder are sent to clinic and medical report that are complete and ready to be taken by insurance agent also will be fill into one form. The existing manual system has caused many problems such as folder are missing, medical report staff spent a lot of time in making monthly statistics for the medical report. So MediTouch system will assist staff in tracking the folder and fill the complete medical report into the system so that they are able to create the statistics by using the system only. But, for tracking the folder that sent to clinic, sometimes they are using MedCare system that the main function is to register the patient. The problem is the folder movement are not updated into the MedCare system because the system is not for HIMS.

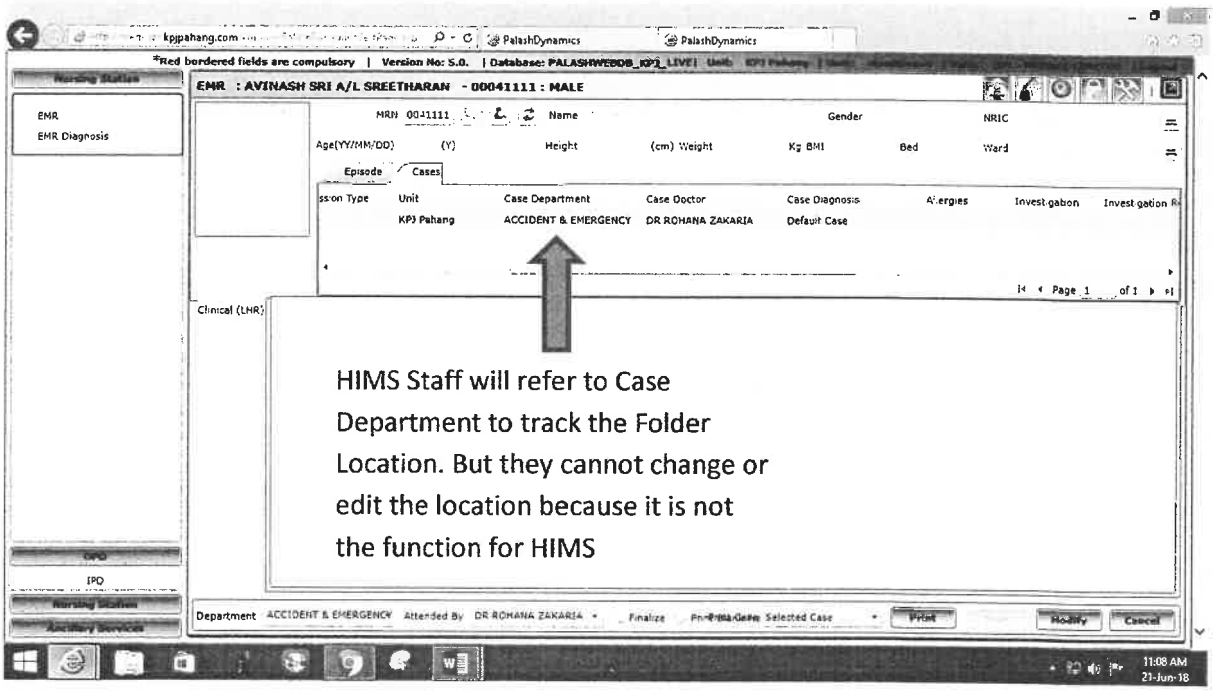
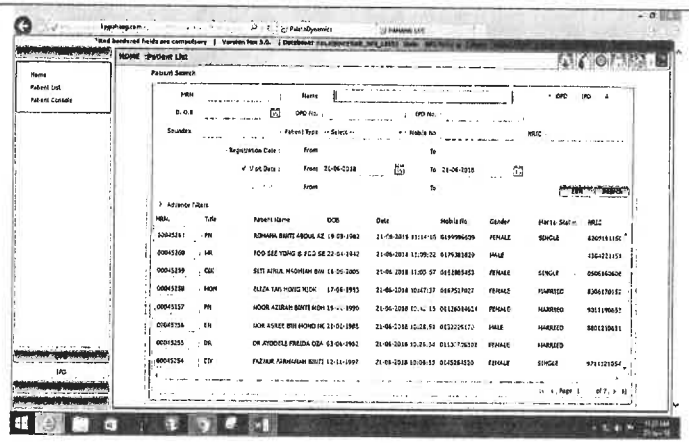
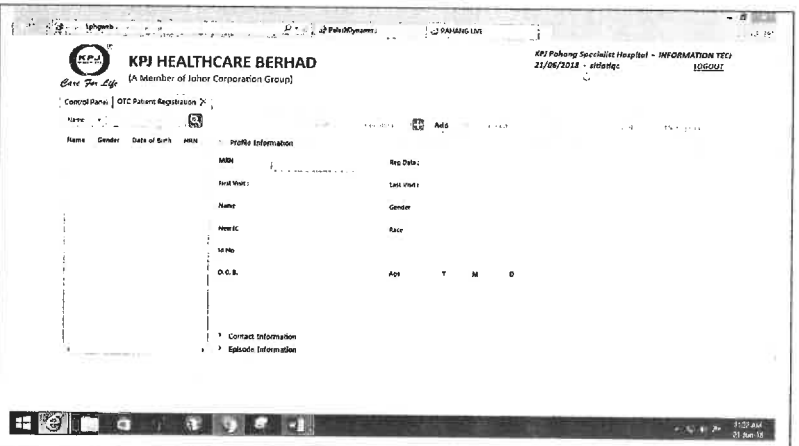


Figure 3.9: Example of MEDCARE System

TABLE 3.5: COMPARISON BETWEEN THE EXISTING SYSTEMS

SYSTEM		
DESCRIPTION	**MEDCARE SYSTEM** **Interface** : Not too many color, and only use three type of color. **Security** :Very secure, staff need to insert username and password **Navigability** : The button needed are easy to be find and easy to navigate. Considered as user-friendly. **Consistency** : Background color and other button looks similar in every different page. **Accessibility:** All authorize user can access the system by connecting to the Local Area Network because the system are Intranet	**HEALTH INFORMATION TECHNOLOGY SOLUTIONS (HITS)** **Interface** : The interface is interesting, not using more than three color **Security** : Very secure, staff need to insert username and password to login. Data are secured **Navigability** : User-friendly and easy to use **Consistency** : The design is simple and same background for every page. **Accessibility:** All authorize user can access the system if they have the internet connection.

3.2.13 Design

According to (Alwan, 2015), "system design is the third phases which comes after the developer really understand about the system requirements". In design phases, I will defines the elements of a system, the components, the security level, modules and also designing the interfaced and type of data that goes through the system. Besides that, I'm also will describes in detail for the necessary specifications, features and operations that will satisfy the functional requirements of the proposed system which will be in place.

3.2.14 Database

For system development, the database used in this project is MySQL database language because it is easy to understand by other developer just in case if other trainee would like to improve the system.

3.2.15 Data Dictionary

Table 3.6: users

Table name	Attribute name	Content	PK or FK
Users	**User_id**	**User unique number**	**PK**
	Username	User username	
	Password	User password	
	Firstname	User firstname	
	Lastname	User lastname	
	Status	User status (Admin or Normal User)	

Table 3.7: Medical Report (MR)

Table name	Attribute name	Content	PK or FK
Mr	**Mr_id**	**Medical report unique id**	**PK**
	Mr_date_req	MR date request	
	Mr_patient	Patient name for Mr	
	Mr_insurance	MR insurance name	
	Mr_consul	MR consultant name	
	Mr_date_complete	MR complete before 2 weeks	
	Mr_after	MR complete after 2 weeks	
	Mr_pay_status	MR pay status (paid or unpaid)	
	Payment_method	MR payment method (cash)	
	Mr_price	MR price need to pay	
	Mr_receipt	MR Receipt Number	
	User_id	User unique number	FK

Table 3.8: tracking

Table name	Attribute name	Content	PK or FK
Tracking	**Tracking_id**	**Folder unique number**	**PK**
	Tracking_mrn	Medical record number tracking	
	Tracking_name	Patient name	
	Tracking_clinic	Consultant clinic (patient visit)	
	Tracking_date	Date folder movement	
	Tracking_status	Folder status (Dispose, Deceased, Pending, Sent to clinic)	
	User_id	User unique number	FK

Table 3.9: activity Log

Table name	Attribute name	Content	PK or FK
Activity_log	**Activity_log_id**	**Folder unique number**	**PK**
	Username	User username	
	Date	Activity date and time	
	Action	User activity during using the system	
	User_id	User unique number	FK

Table 3.10: user_log

Table name	Attribute name	Content	PK or FK
User_log	**user_log_id**	**Folder unique number**	**PK**
	Username	User username	
	Login_date	Date and time user login	
	Logout_date	Date and time user logout	
	User_id	User unique number	FK

3.2.16 Storyboard

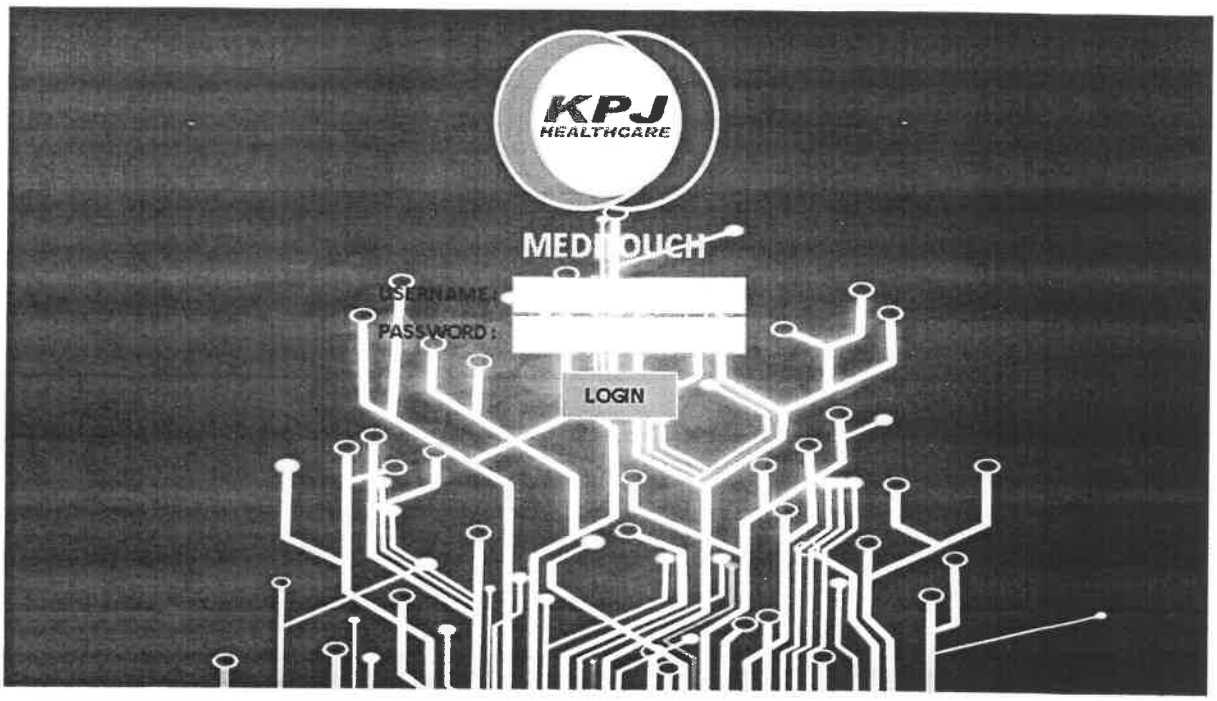


Figure 3.10: Interface for Login into the System (For HIMS Staff and Clinic Assistant)

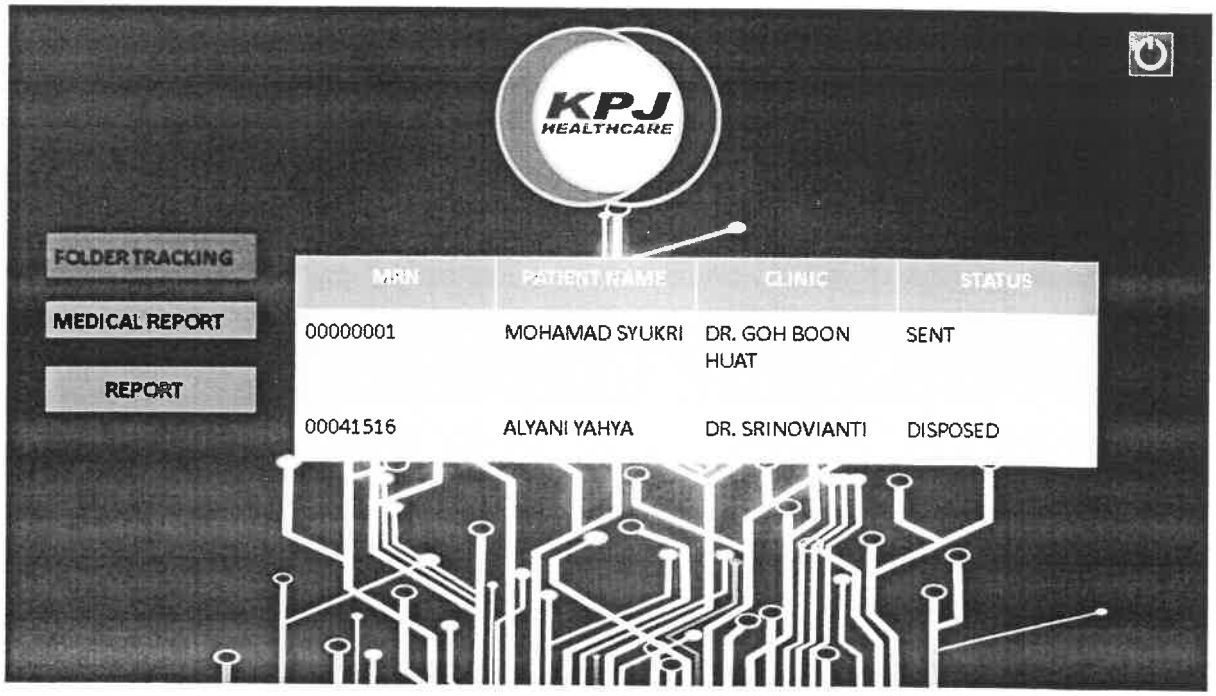


Figure 3.11: Folder Tracking Interface (Available for HIMS Staff only)

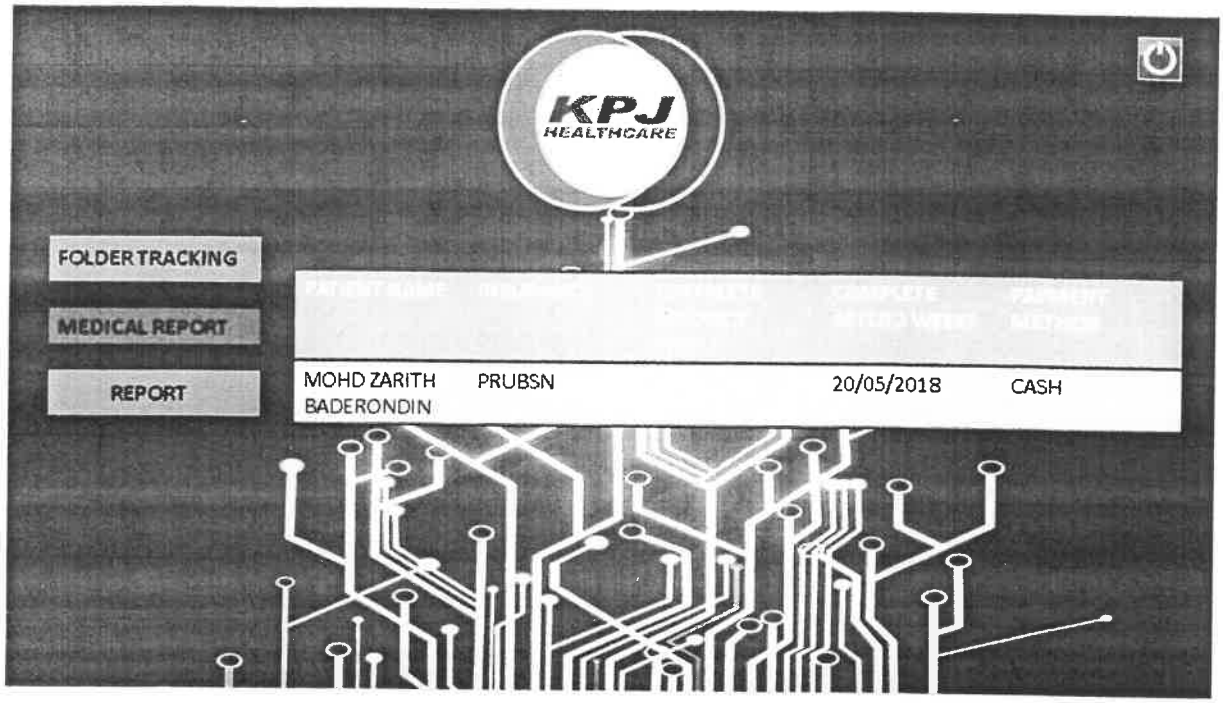


Figure 3.12: Interface for Medical Report Page (Only Available for HIMS Staff)

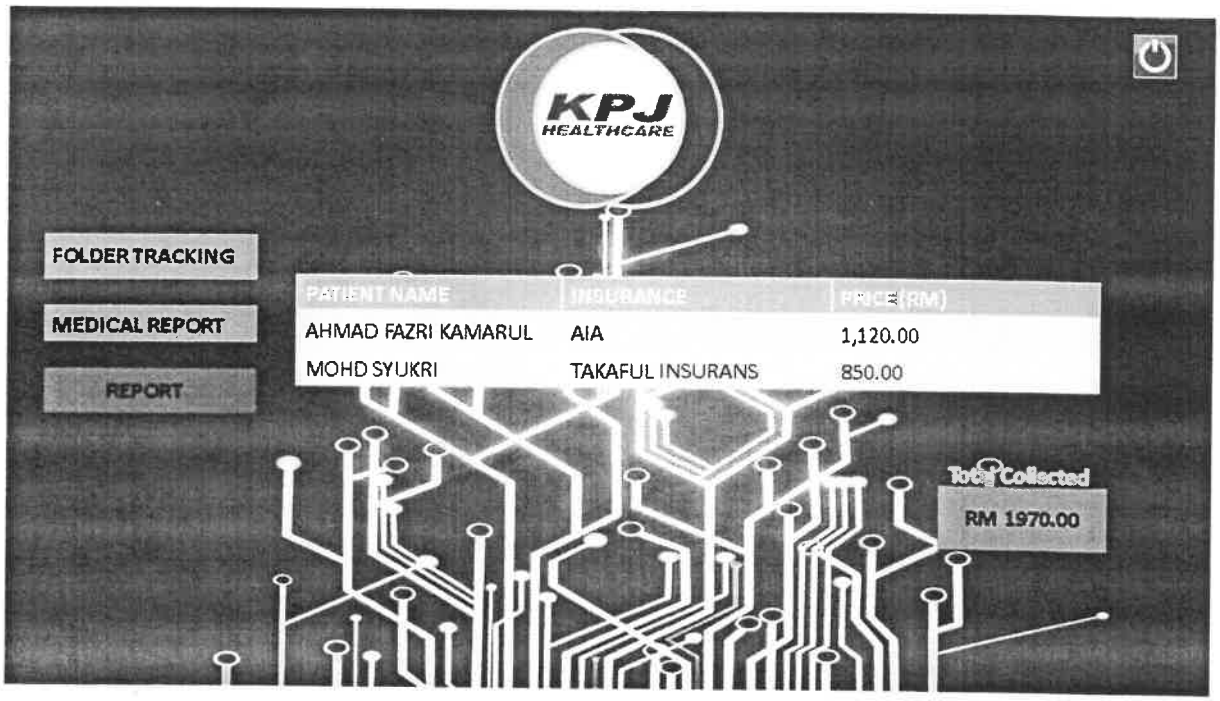


Figure 3.13: Interface for Report Page (Only Available for HIMS Staff)

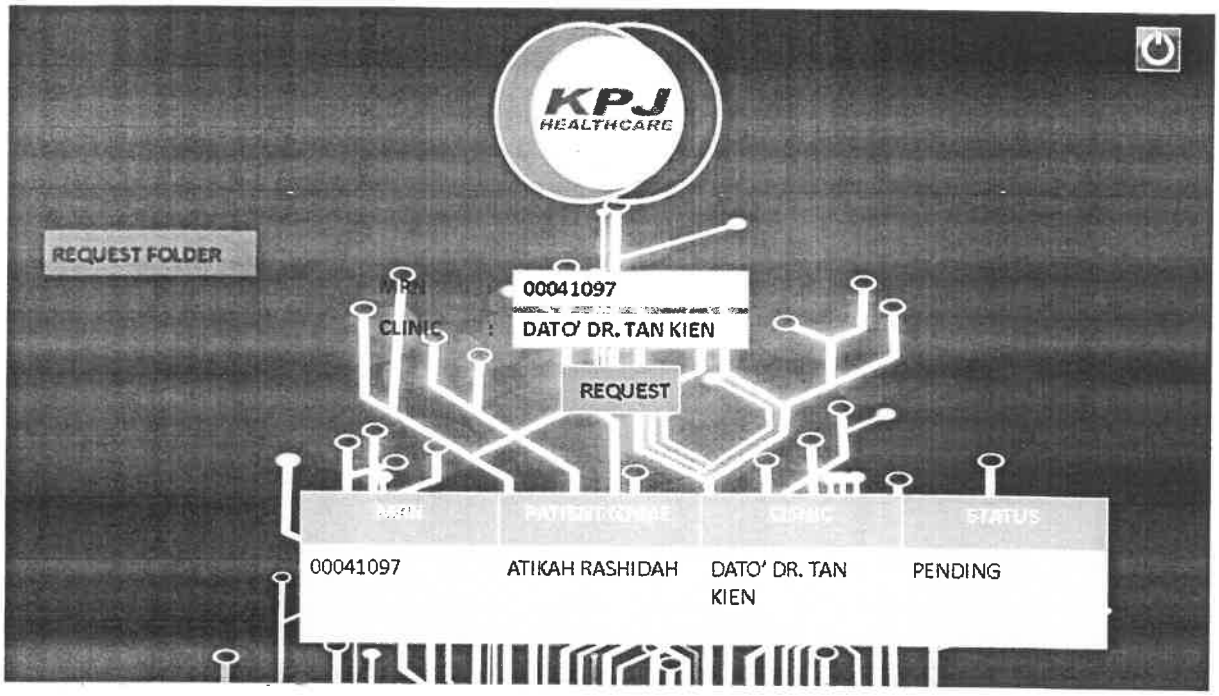


Figure 3.14: Interface for Folder Request (Only Available for Clinical Assistant)

3.2.17 Interface Design

Figure 3.15: Login Interface

3.2.18 Interface Design (Admin)

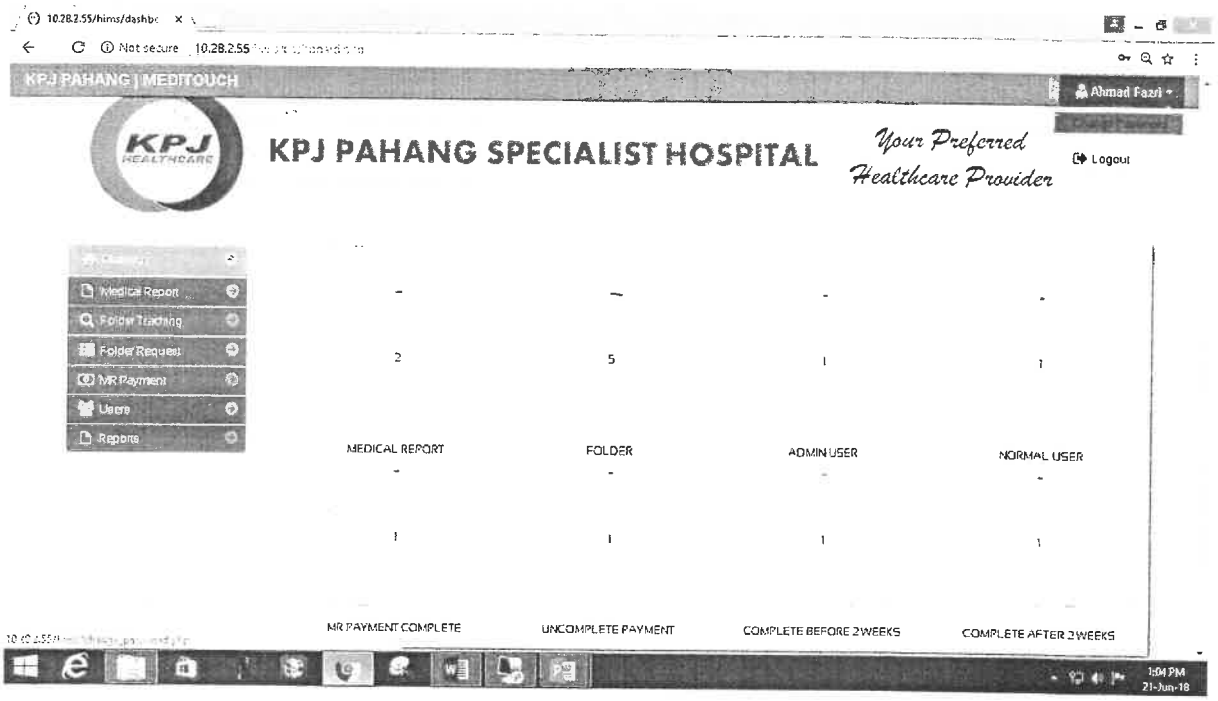


Figure 3.16: Admin Homepage with Statistics

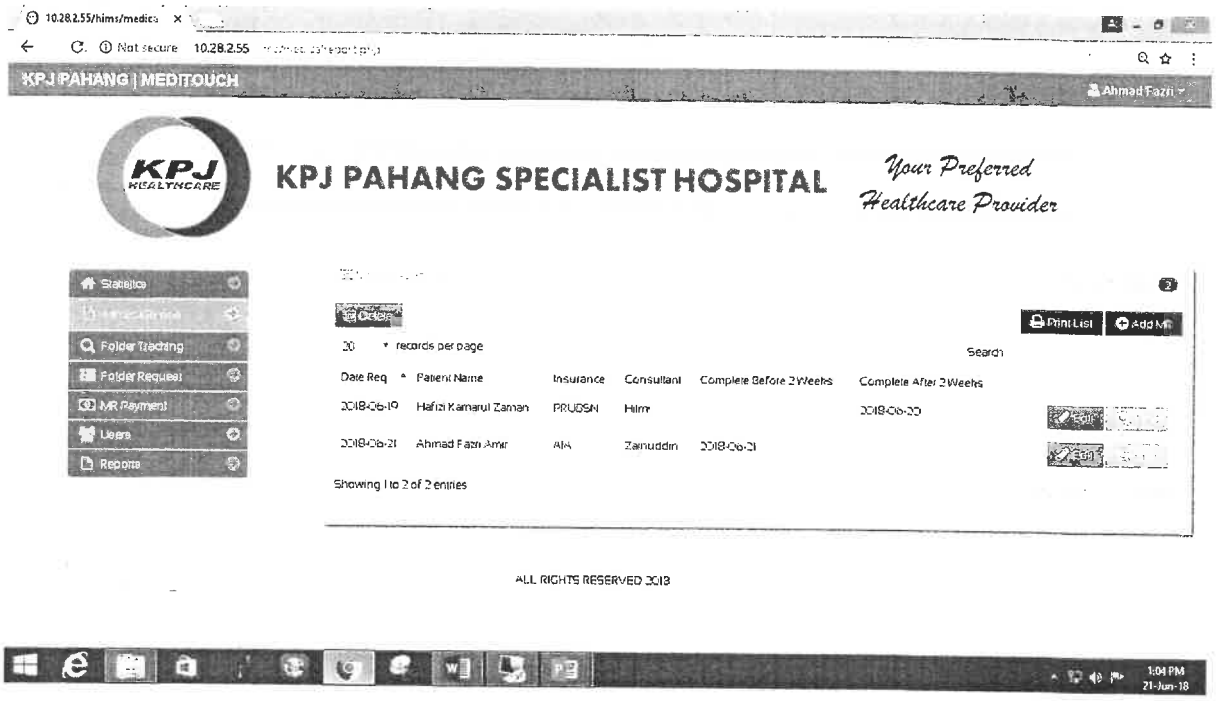


Figure 3.17: Medical Report Page (Add, Edit, Delete & View Medical Report)

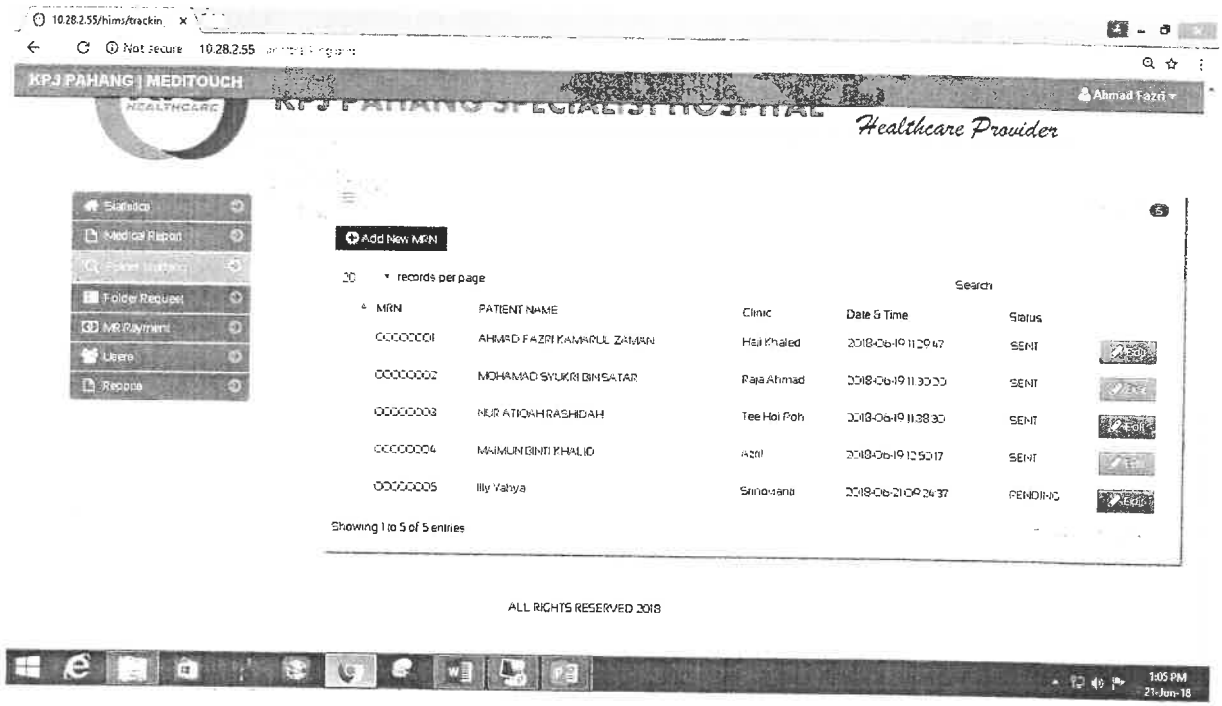


Figure 3.18: Folder Tracking Page (Admin can Edit Location & Add New MRN)

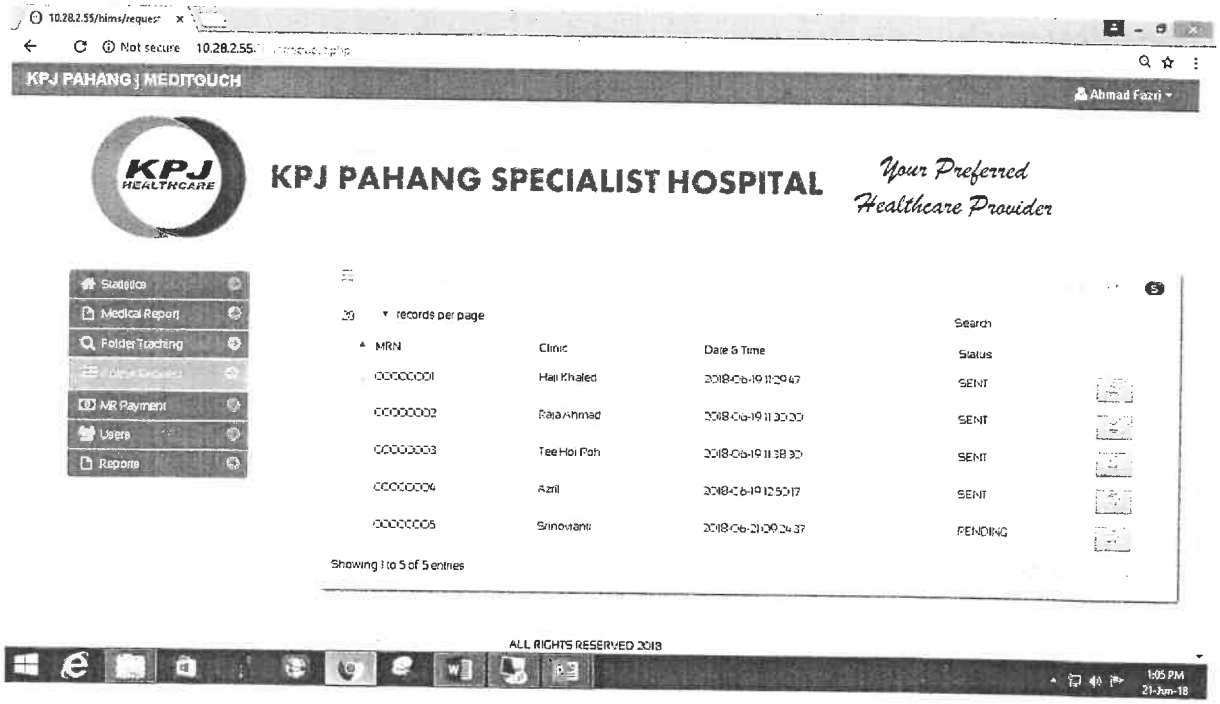


Figure 3.19: Folder Request Page (Admin can Update Status)

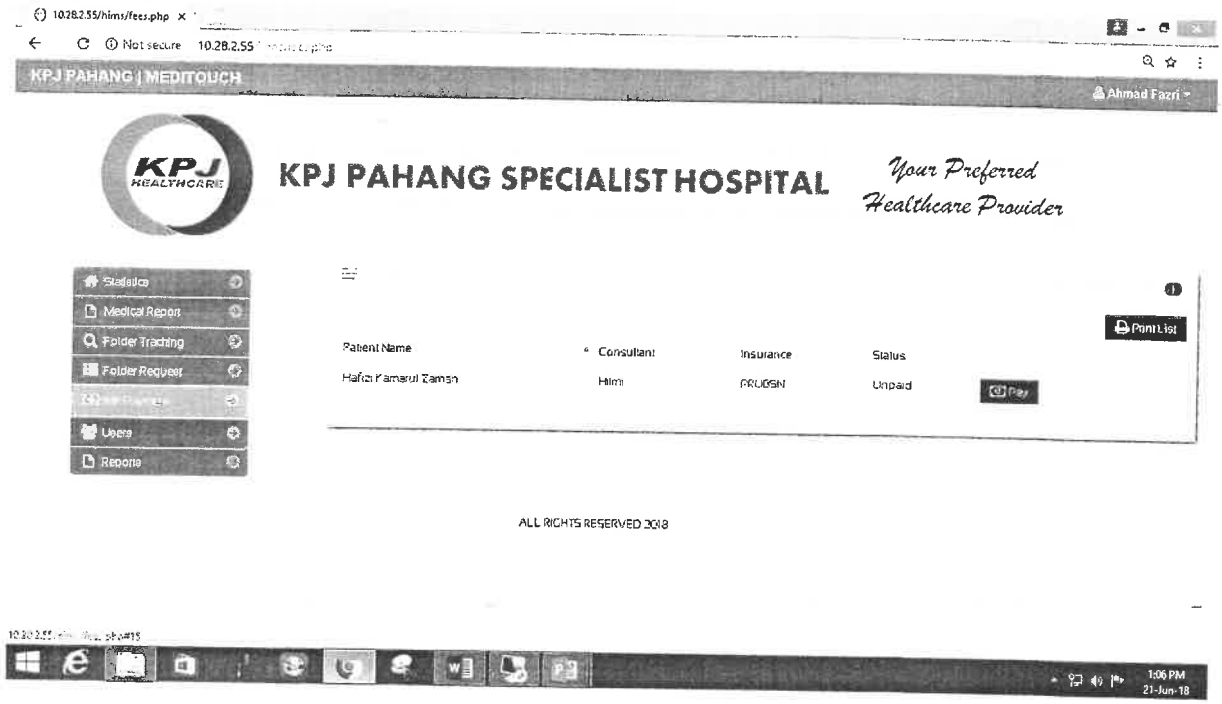


Figure 3.20: Medical Record Payment Page (Admin able to Update Payment Status)

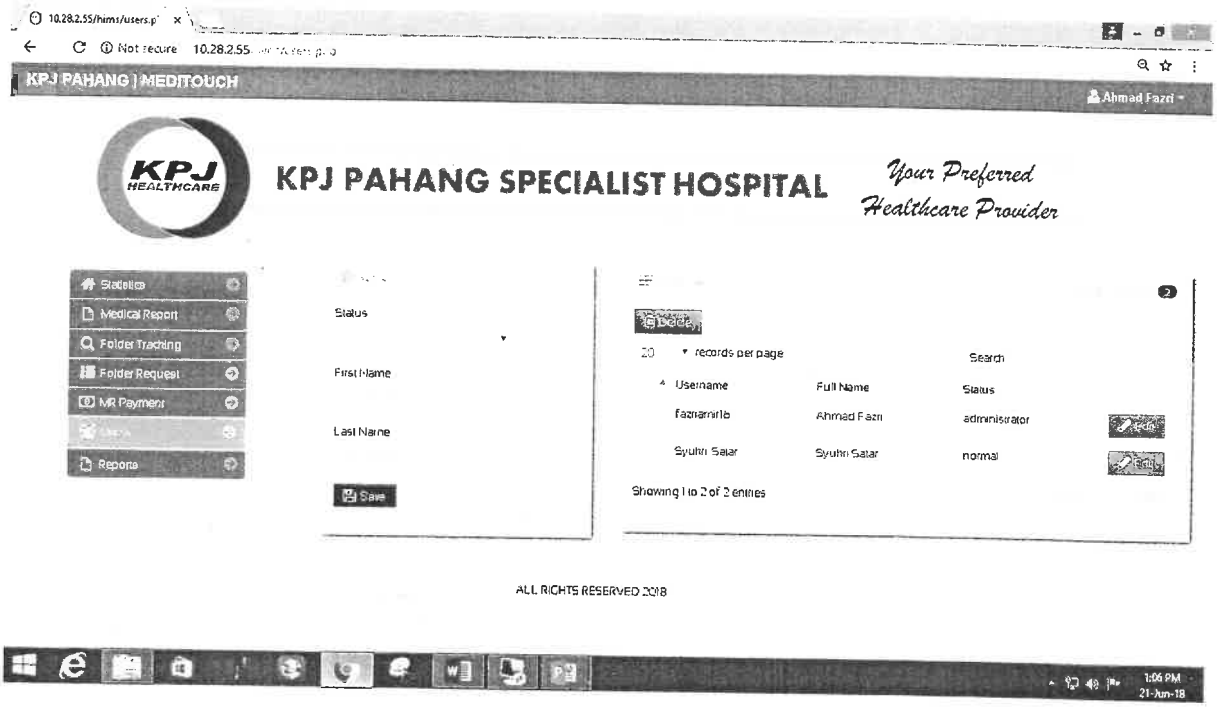


Figure 3.21: User Management Page (Add, Edit & Delete User)

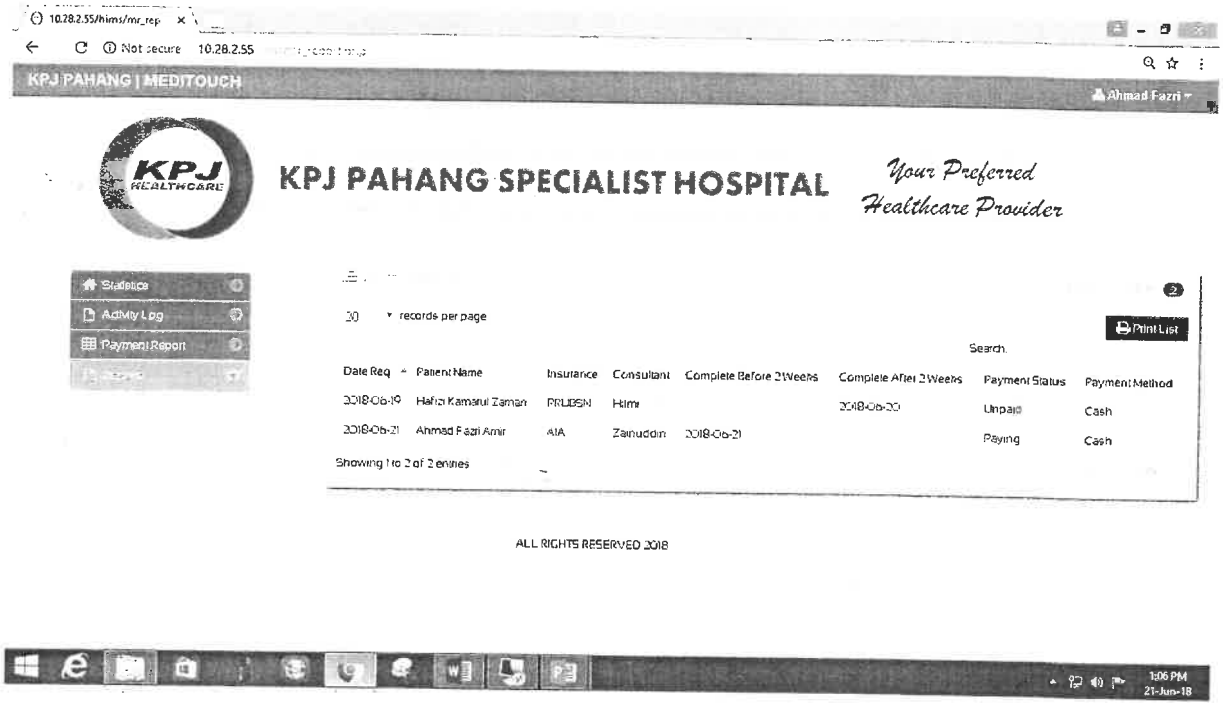


Figure 3.22: Overall Medical Report Page (Admin able to Print)

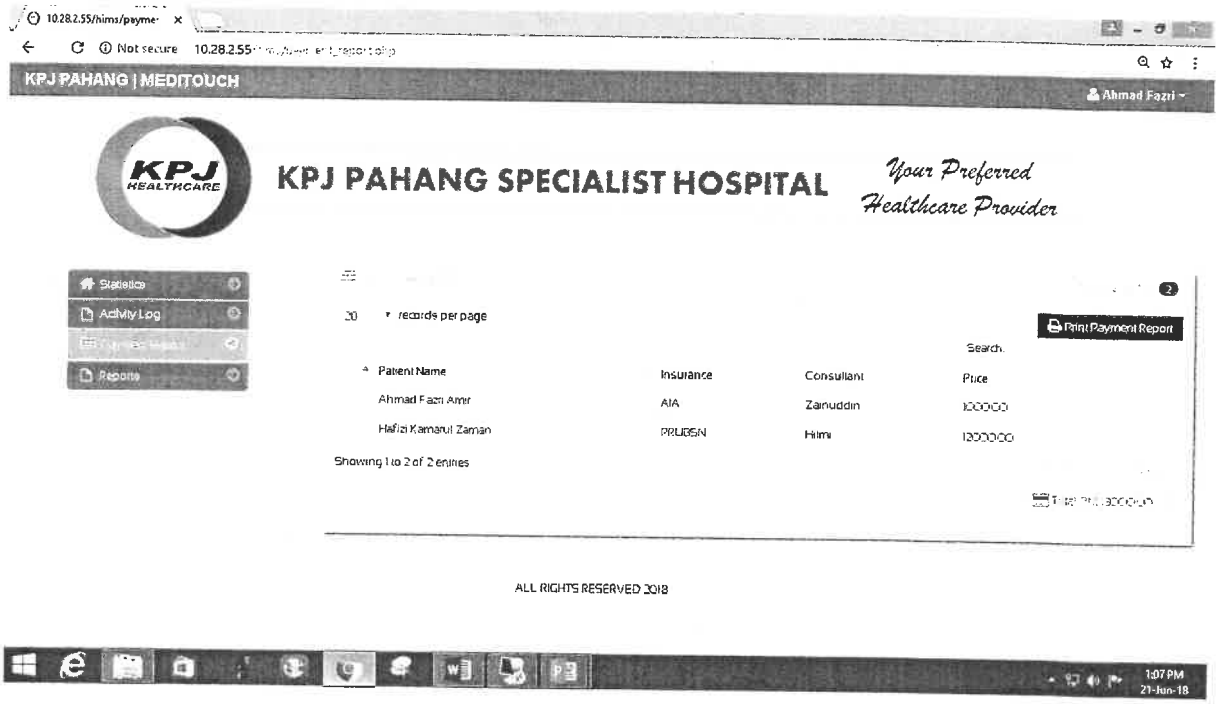


Figure 3.23: Payment Report (Medical Report) Page (Admin able to view total payment)

3.2.19 Interface Design (User/Clinic Assistant)

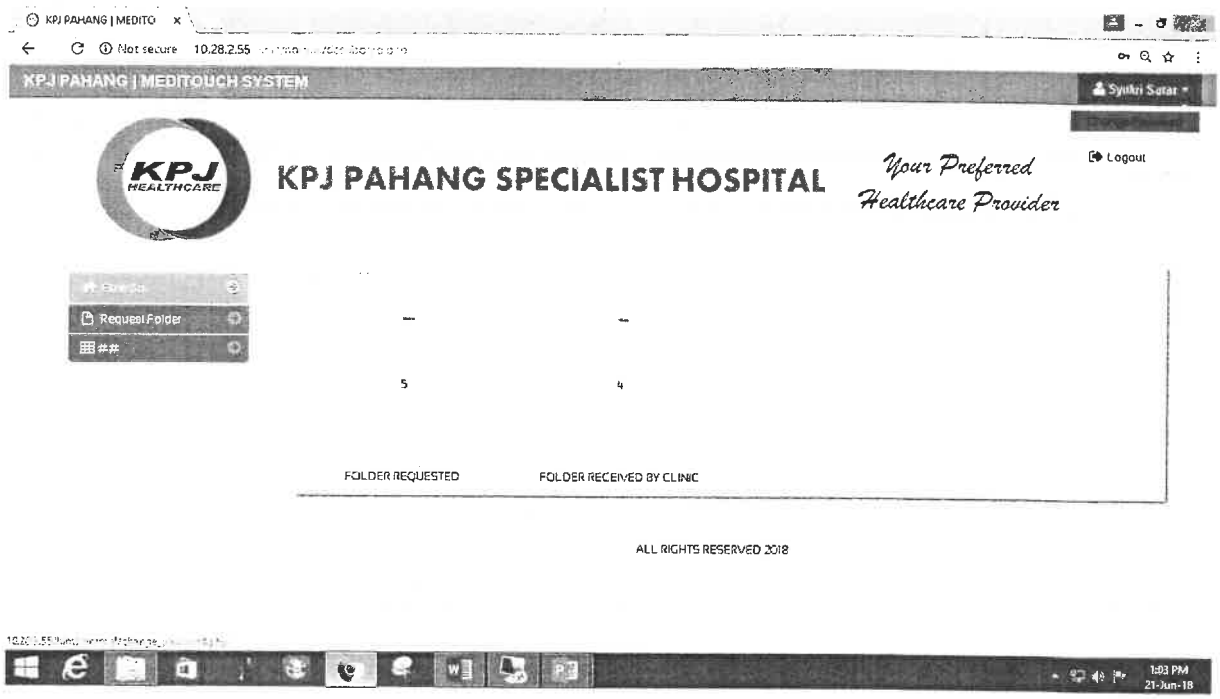


Figure 3.24: Normal User Homepage

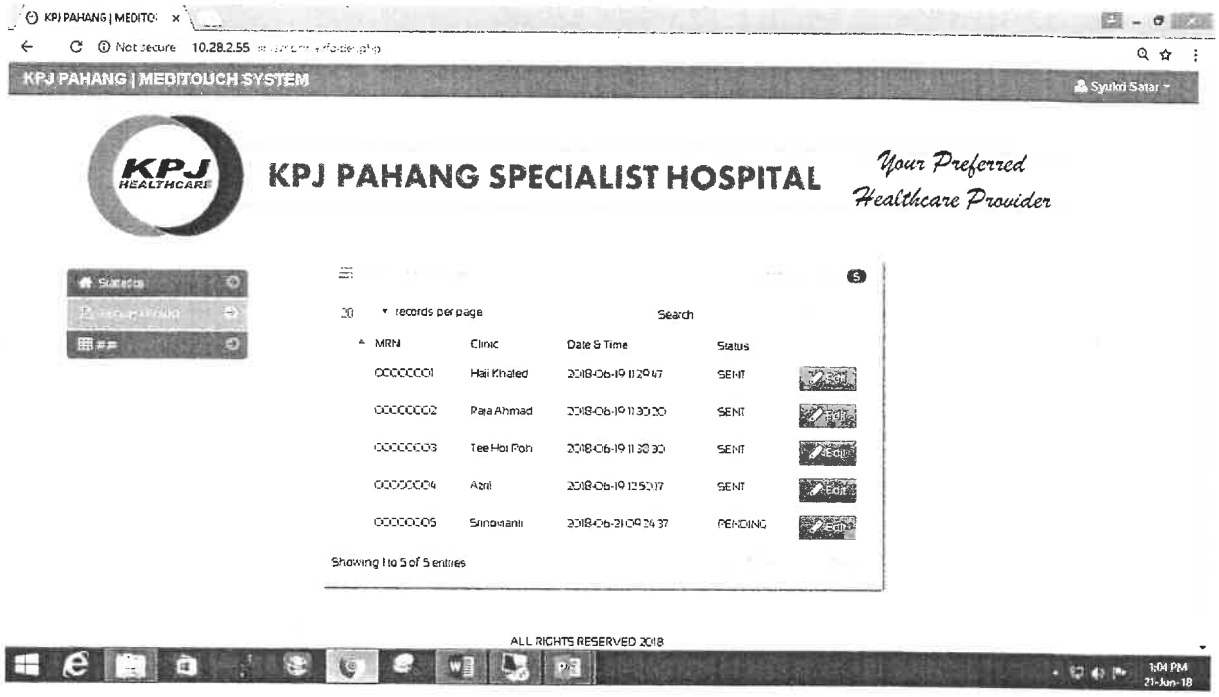


Figure 3.25: Page for User to Request New Folder

3.2.20 Implementation

3.2.20 Summary of Implementation

Implementation is the fourth phases in system development lifecycle. According to (Alwan, 2015), "implementation is when the majority of the code for the program is written, and when the project is put into production by moving the data and components from the old system and placing them in the new system via a direct cutover". Before proceeding into this phases, I must ensure that I'm completely understand about the system requirements and specifications because this is the most important phases to ensure the system are coded according to the design that has been agreed by Health Information Management Services (HIMS).

Implementation is the most expensive and time consuming in System Development Lifecycle (SDLC) because it involves the real development of the system by using many programming languages. In this phases, the actual code are written and if the system contains hardware, then the implementation phase will contain configuration and fine-tuning for the hardware to meet certain requirements and functions. Besides that, there is energy consuming also for this phases because I'm requiring other KPJ Pahang staff to involved in this phases but there do not have any expert in this programming field. For the database designer, trainer, programmer are handle by me because KPJ Pahang doesn't have experience in system development and also to ensure the system can be finished according to the timeline.

3.2.21 Five Major Activities Involved in Implementation Phases

3.2.21.1 Coding

According to ("What is Coding? 15 Facts for Beginners", 2015), coding can be defined as set of instructions (or rules) that computers can understand and it might be helpful to think of code as a recipe. In developing the MediTouch System, I'm using multiple programming languages such as C++, Hypertext Markup Language (HTML), Hypertext Preprocessor (PHP), and also JavaScript. It is to ensure all function in the system can work properly according to the system requirements. I have referred to the documentation before start the coding process, to ensure the system are following the requirement needed. I have referred to the Data Flow Diagram, Context Diagram and also Entity Relationship Diagram to manage the data and flow of the system so that it will be easier for determine which one should come first in the system.

3.2.21.2Testing

After coded for the system, I am responsible to testing the system. To run the test, coding phases must fully complete for the whole system. I will conducting the user acceptance test (UAT) to ensure all module and features in the system running properly and ready to be installed into the local server. Testing is about investigate or try the coding that has been completed and it can be done individually, for the part of a larger program and this system need to be execute. After that, the system can be tested by actual user of the system and this is similar to the pilot project. In this phase, I will collect the feedback from user in term of its design, function, and also modules. So I'm available to improve and fix the system before it is launched and installed to into KPJ Pahang local server.

3.2.21.3 Test Plan

Test plan is the detailing systematic to testing the system by machine. This testing plan is to understanding the workflow of the system. In test plan, it is to enhance the communication among all the people involved during testing the application software in the test plan have the objective such as:

i. First thing that user need to access is login interface, that I have provided one interface only. After admin and user insert their username and password, the system will determine which page the system will enter according to the username whether admin page or user page. The system must be successful to operate from all aspects such as interface, login button, logout button, and also the connection with database.

ii. The system must be run smoothly and no failure of all system button and other function. This is because I want to avoid from having complaints about the system.

3.2.21.4 Type of Testing

i. Testing Unit

In testing unit, I will test for each module existed in the system. Such as folder tracking, medical report modules and other. This module is important because it is related with the objective of the system. If this module is not functioned, then I will not achieve the objective.

ii. Testing Integration

For the testing integration, the button in the system must be function in order to avoid problems in the system. The system need to verify and test the system before launched the system. The function such as fill up the detail for the medical report is inserted into databases to ensure it can be retrieved again by admin and also user.

3.2.21.5 Supporting Documents

In developing the system, I'm using certain references as guidelines in order to develop a good system. I'm referring the documentation that has been completed in the planning phases, internet sources, journal and also diagram such as Data flow, context diagram and Entity relationship diagram.

3.2.21.6 Testing Requirements

To test the system that has been developed, there is some requirement needed to test the system such as software and hardware to ensure the system are compatible with client.

3.2.21.7 Hardware

a. Computer

KPJ Pahang are using Lenovo brand for the computer in order to develop the system. According to (Beal, 2014), computer can be defined as a programmable machine. The two principal characteristics of a computer are: It responds to a specific set of instructions in a well-defined manner and it can execute a prerecorded list of instructions (a program).

b. Printer

KPJ Pahang are using HP Officejet Pro X451 PL6. According to (Beal, 2014), a printer is an output device where it accepts any input such as text and graphic from the computer and transfers the information as an output to paper. Printers are regardless in size, speed, sophistication, and cost. The use of printer will make easier for the printing process especially for the testing phases, and also documentation.

c. Server

KPJ Pahang are using SangFor x86 server that installed into the server room and can be controlled remotely by using windows server 2012.

3.2.21.8 Software

a. Wamp Server

Wampserver refers to a software stack for the Microsoft Windows operating system, created by Romain Bourdon and consisting of the Apache web server, OpenSSL for SSL support, MySQL database and PHP programming language. PHP as main language in the system, it is an interpreted computer programming language. This PHP will allow the programmer to create the content that can be connected to the database and Wamp Server already installed into the local server addressed 10.28.2.55 (SangFor)

b. Adobe Photoshop

Adobe Photoshop is a raster graphics editor developed and published by Adobe Systems for Windows and OS X. Photoshop was created in 1988 by Thomas and John Knoll. It can edit and compose raster images in multiple layers and supports masks, alpha compositing and several color models including RGB, CMYK, Lab color space (with capital L), spot color and duo tone. I'm using photoshop for editing the icon, or image to be inserted into the system.

3.2.22 Installation

3.2.22.1 Installation Details

After the coding has been tested by user and system analyst, the next process is installing the system into KPJ Pahang local server. Before installing the system, I must monitor the performance of the current computer that is used by client to ensure it is compatible with the system. After that, I will ensure the computer is secure and safe from any threats then IT Staff will install the system. The local server is protected with the firewall, intrusive prevention system and intrusive detection system.

3.2.22.2 Audiences

Audiences for this system are HIMS Staff and clinical assistant. HIMS Staff are able to record all the information about medical records and there are able to tracking the folder movement. Clinical Assistant are able to request folder if they would like to use the folder at the consultant suites.

3.2.22.3 Hardware for Client

i. Computer
ii. Keyboard
iii. Mouse
iv. Printer
v. Server

3.2.22.4 Software for Client

i. Wamp Server
ii. Windows Operating System
iii. MySQL
iv. Windows Server 2012

3.2.23 Training

I will organize training for the HIMS Staff to train them in order to use the system and understand how the system works. If they understand the concept of the system, then they are able to use the system effectively without any mistakes. Besides that, I will provide user manual for staff in HIMS so they are able to refer the manual in using the system. The user manual can be used as:

i. A surface or introduction to subject matter prior to training.

ii. Act as a guidance to be followed during training.

iii. Can be a reference after the training completed.

3.2.24 Support

3.2.24.1 Online Help

Online help work to assist user in the use of the system and also can be used to present information on a broad range of subjects. User is able to solve the problems by using online help if there are conflicts occur during using the system. Basically, KPJ Pahang will use remote software to solve the problem remotely by using Team Viewer.

3.2.24.2 Help Desk

Help Desk is a resource intended to provide the customer or end user with information and support related to a company or institution's products and services. The purpose of a help desk is usually to troubleshoot problems or provide guidance about the system so that client is able to use the system 24 hours a week and if problems occurs, HIMS Staff are able to contact Information Technology Staff that are responsible for the maintenance of the system even during weekend.

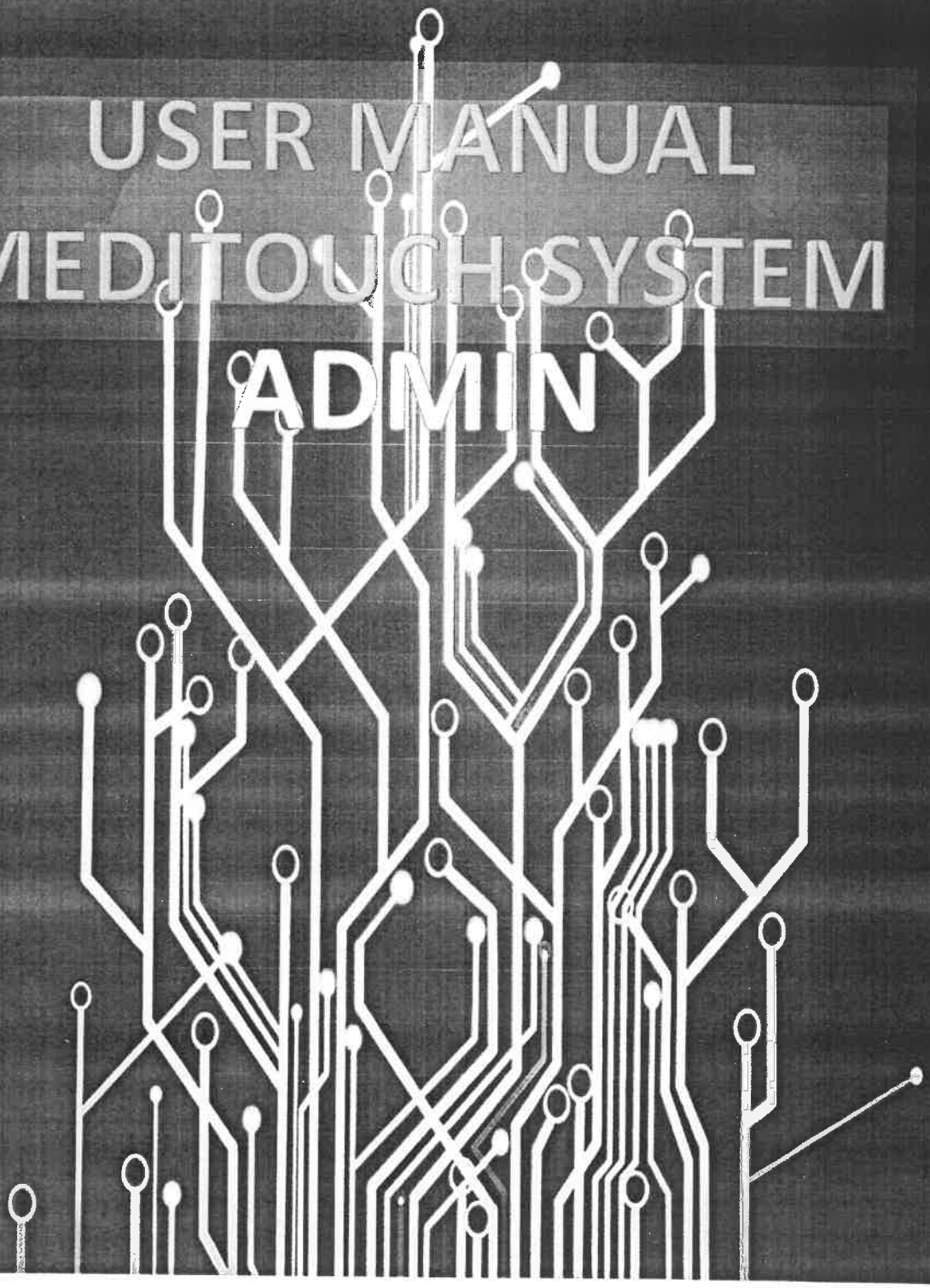
3.2.25 User Manual

In order to assist the user in using the system, I have provided the user manual completely and they are able to learn from the user manual if they are any problems occur in the future. Besides that, they are able to use the user manual to guide a new staff in the future in using the system.

USER MANUAL

KPJ HEALTHCARE

USER MANUAL
MEDITOUCH SYSTEM
ADMIN



KPJ PAHANG SPECIALIST HOSPITAL

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USER MANUAL

LOGIN

1. Insert System Link = 10.28.2.55/hims
2. Insert your Username
3. Insert your Password
4. Click Login

KPJ PAHANG SPECIALIST HOSPITAL

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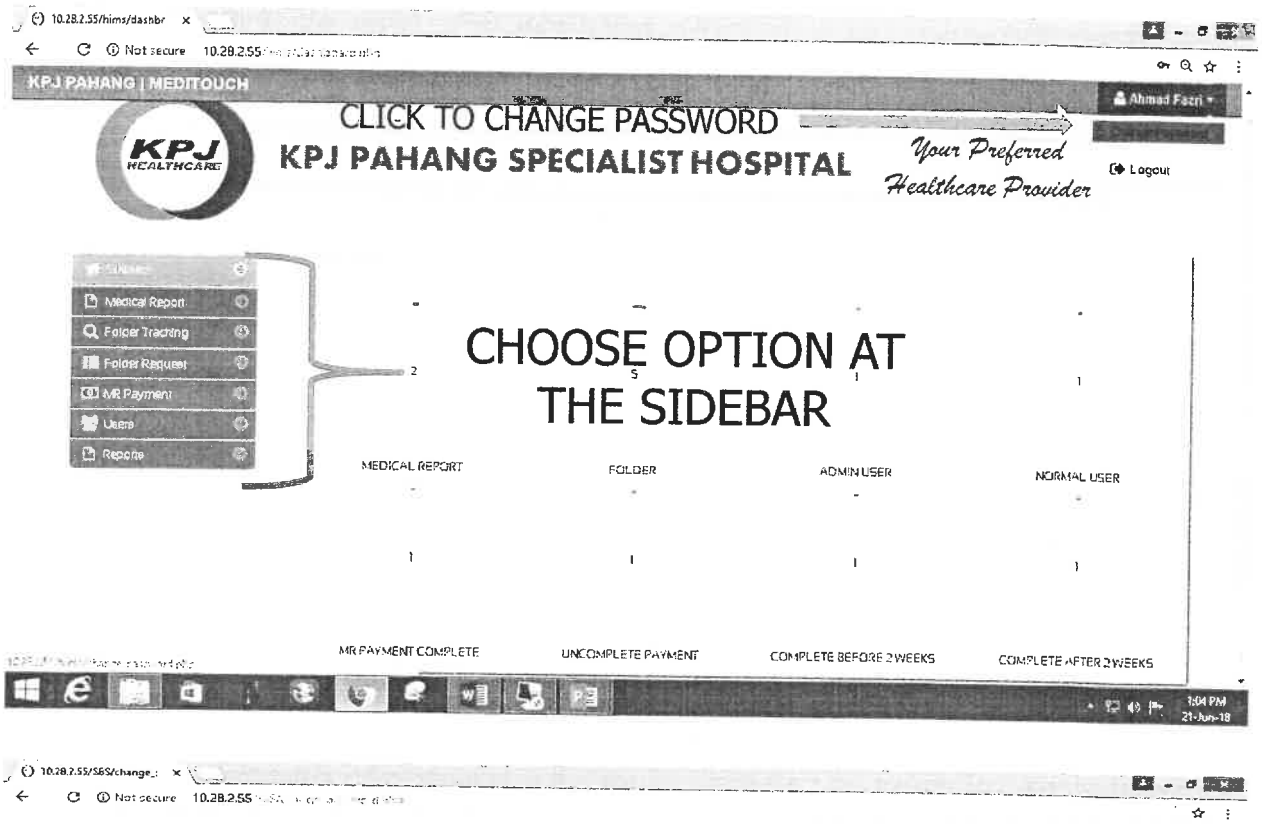
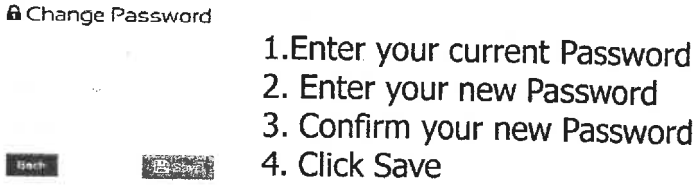
USER MANUAL

HOME





1.Enter your current Password
2. Enter your new Password
3. Confirm your new Password
4. Click Save

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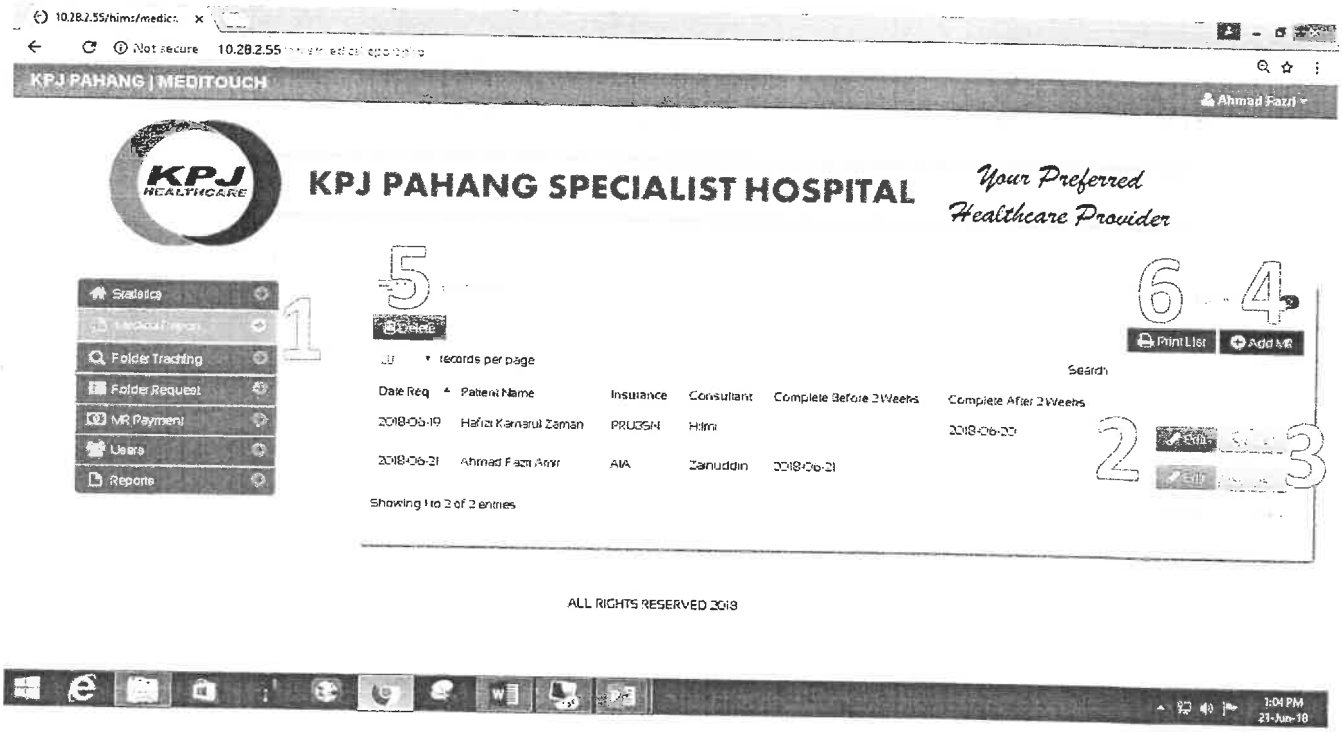
USER MANUAL
MEDICAL REPORT



1. Click Medical Report at Sidebar
2. Click Edit Button to Update or Edit New Details
3. Click View Button to View Medical Report Details
4. Click Add MR to add new Medical Report
5. Click Delete to Remove the Medical Report
6. Click Print to Print out all Medical Report List

KPJ PAHANG SPECIALIST HOSPITAL

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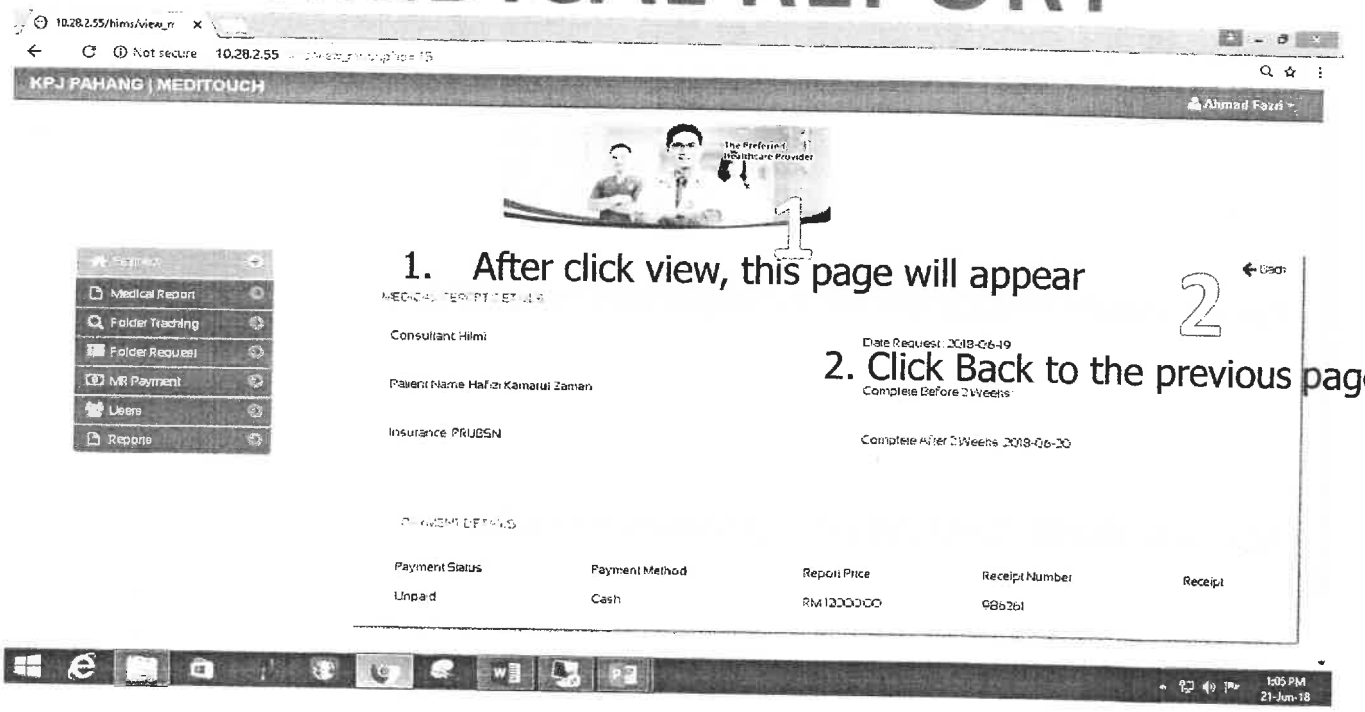
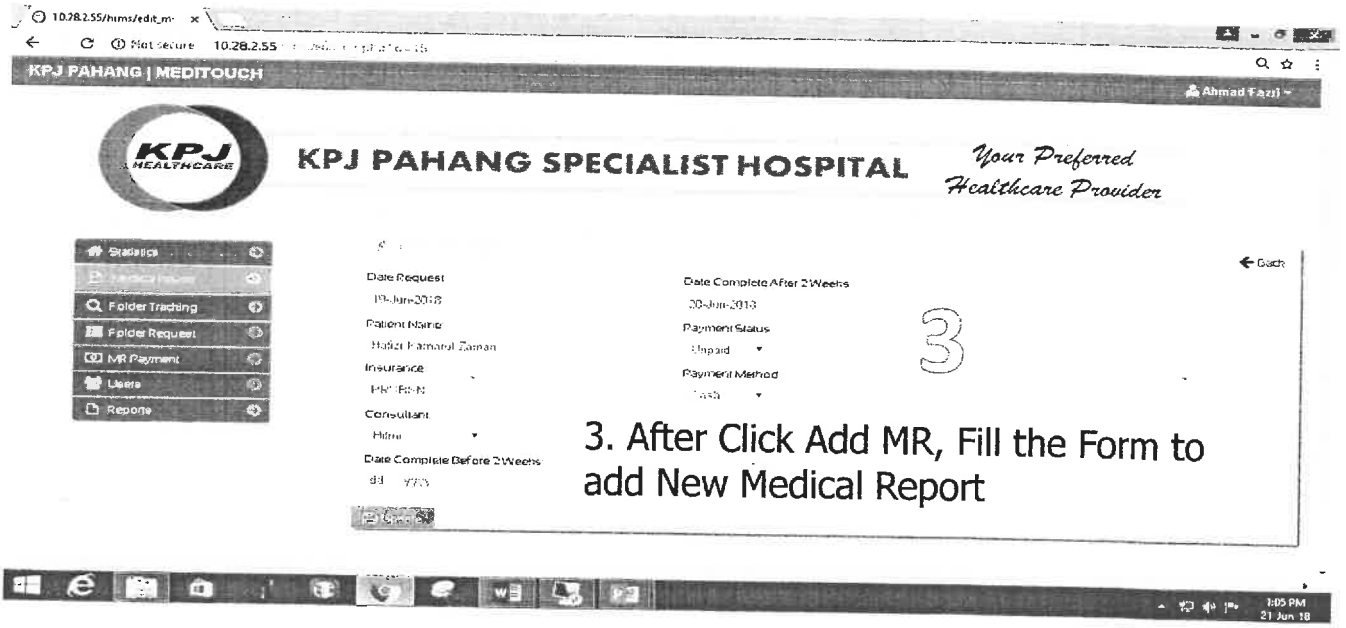
USER MANUAL
VIEW & ADD
MEDICAL REPORT





KPJ PAHANG SPECIALIST HOSPITAL

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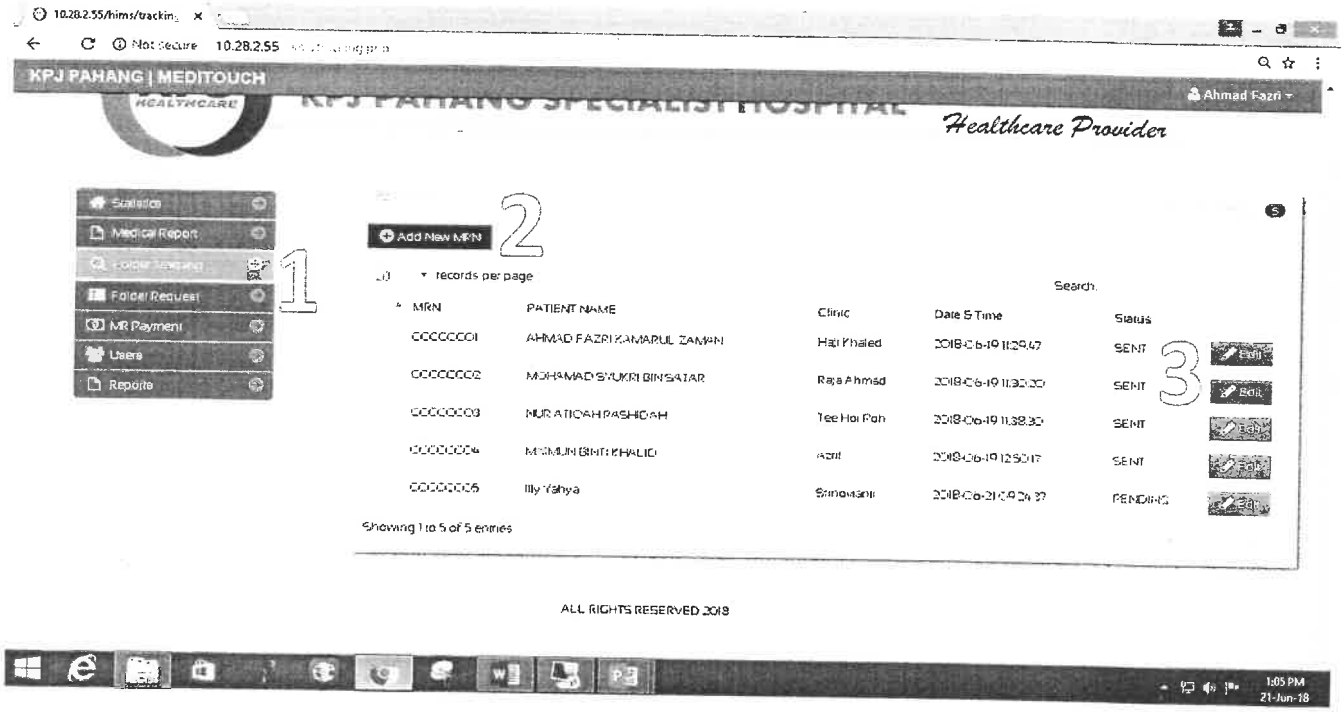
USER MANUAL

FOLDER TRACKING



1. Click Folder Tracking at the Sidebar
2. Click Add New MRN to add new records
3. Click Edit to Update the Folder Location and Status

KPJ PAHANG SPECIALIST HOSPITAL

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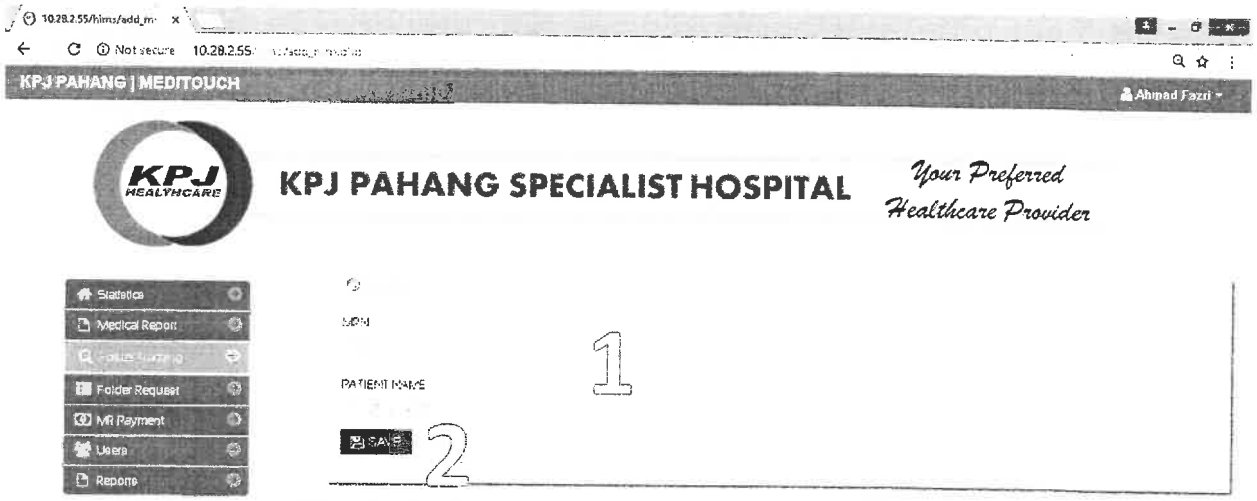
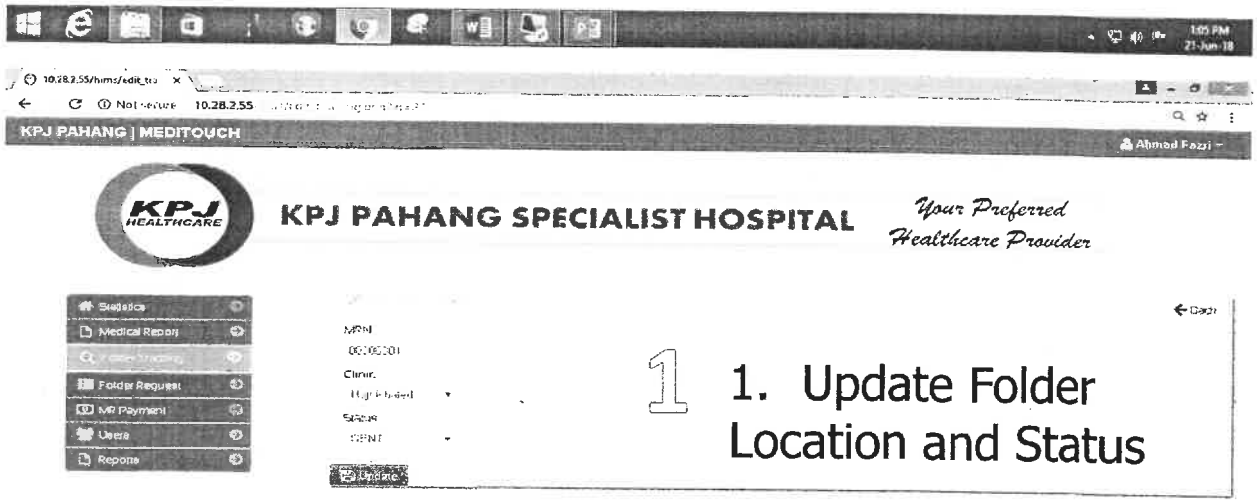
USER MANUAL
ADD NEW MRN & EDIT FOLDER LOCATION



1. After Click Add New MRN, this page appear. Insert MRN Details
2. Click Save to Add New Data



1. Update Folder Location and Status

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USER MANUAL
FOLDER REQUEST

1. Click Folder Request to View Request From Clinic
2. Click Tick Button to Update status to "SENT"

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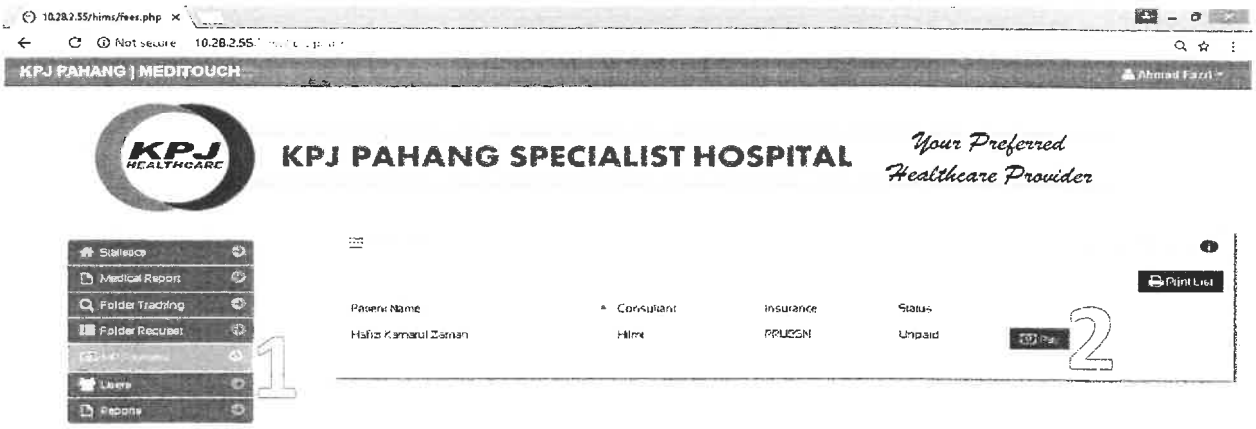
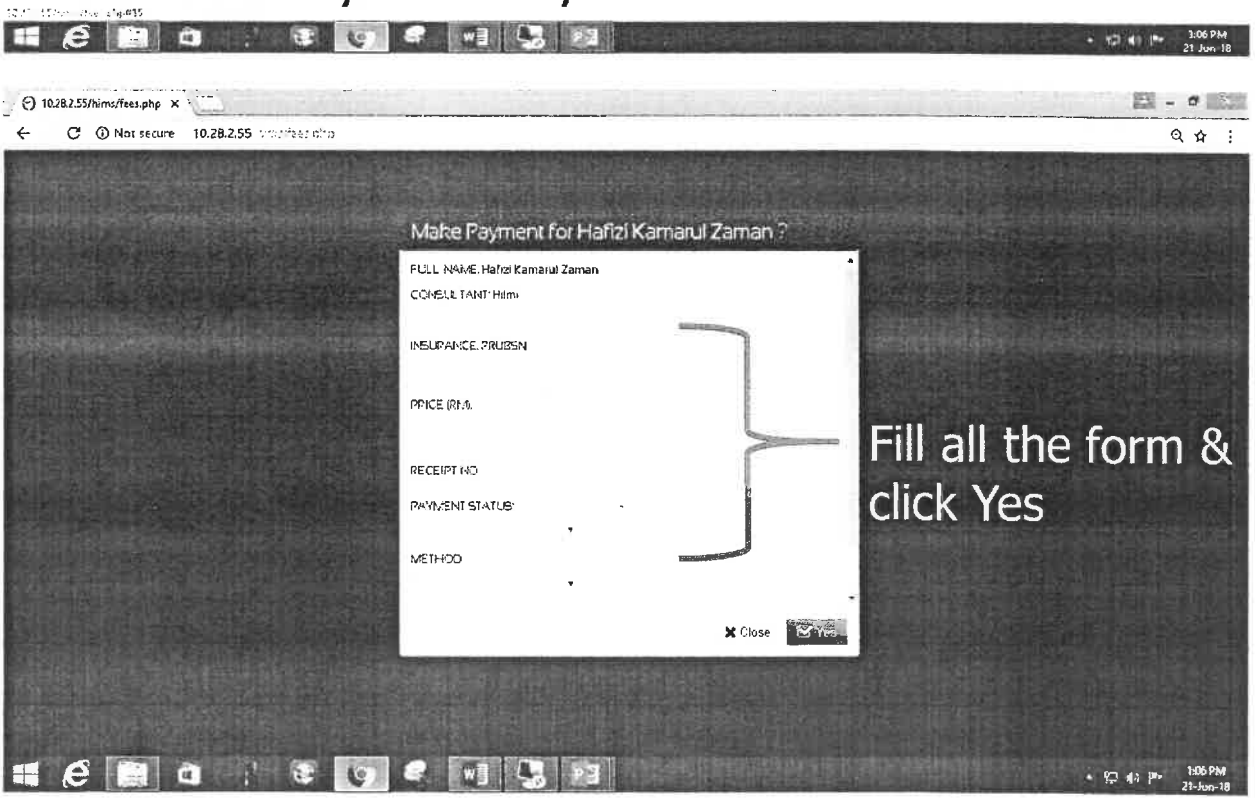
USER MANUAL MEDICAL REPORT PAYMENT



1. Click MR Payment to update patient payment
2. Click Pay to Fill Payment Form



KPJ PAHANG SPECIALIST HOSPITAL

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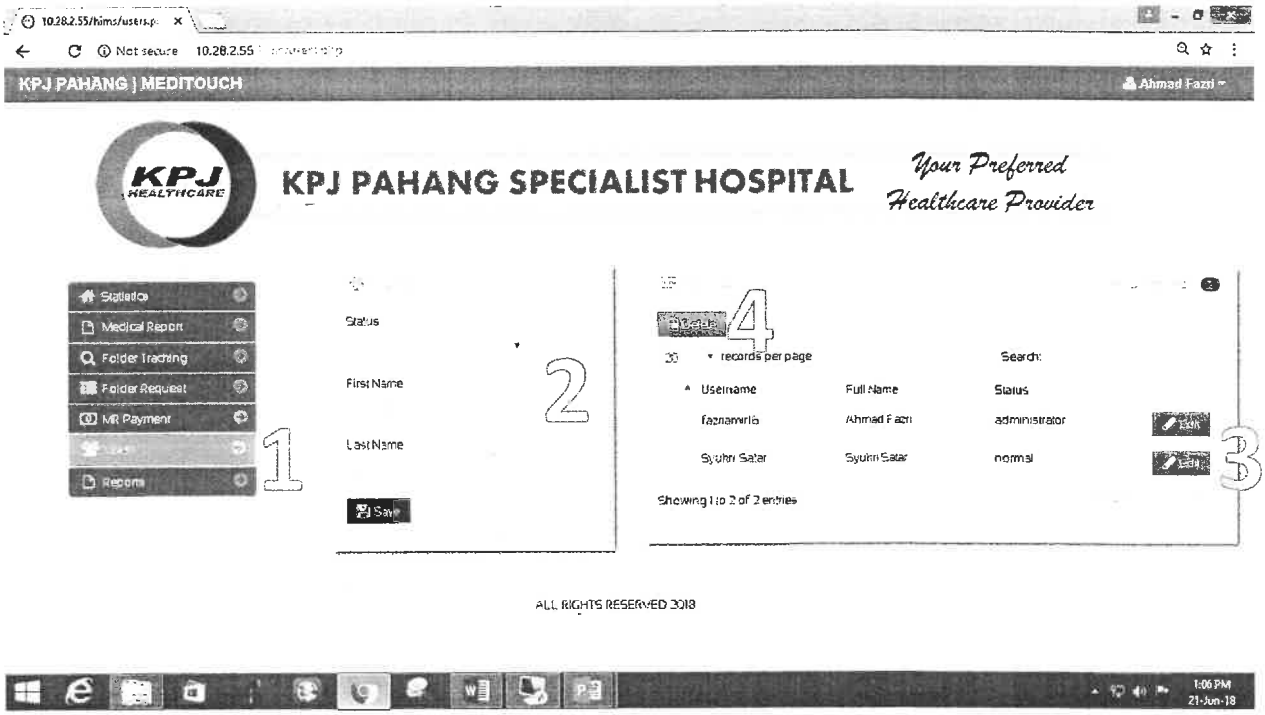
USER MANUAL

USERS

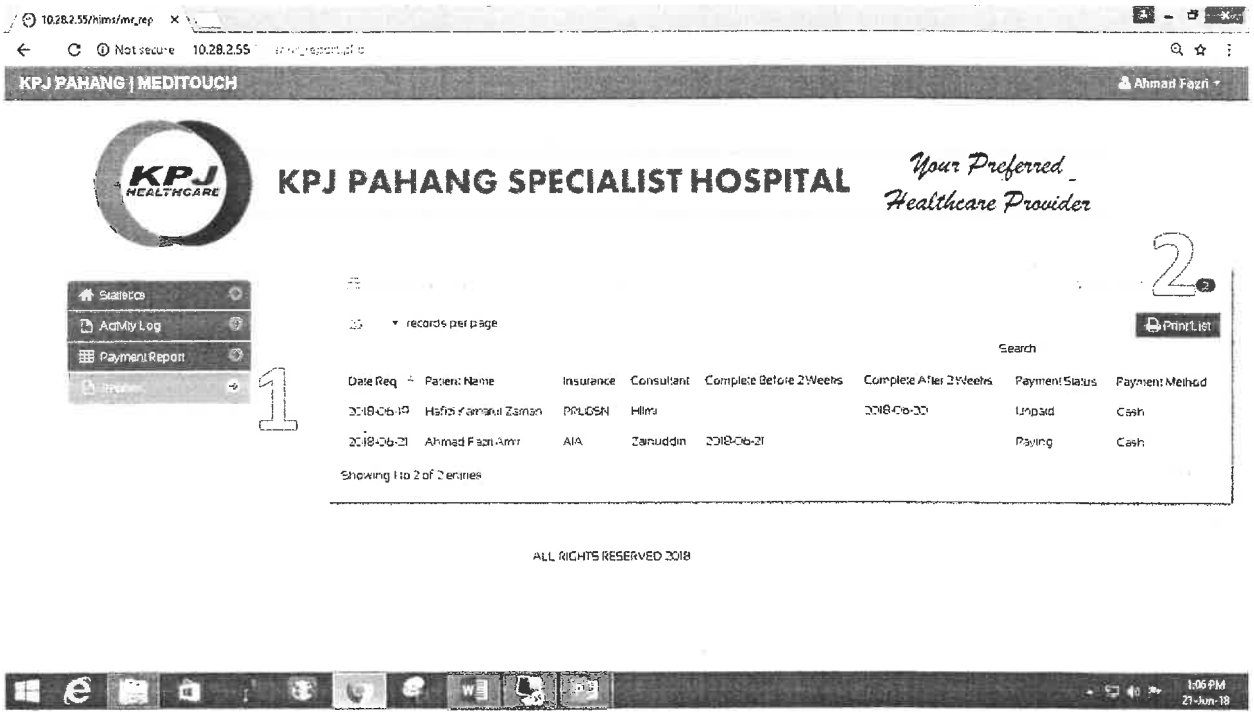


1. Click Users to Manage Users
2. Fill the form and click save to add new user (The password will be automatically set to "12345". User require to change their password
3. Click Edit to Update the User Information
4. Click Delete to Remove Inactive User

KPJ PAHANG SPECIALIST HOSPITAL

Your Preferred Healthcare Provider

USER MANUAL
REPORTS



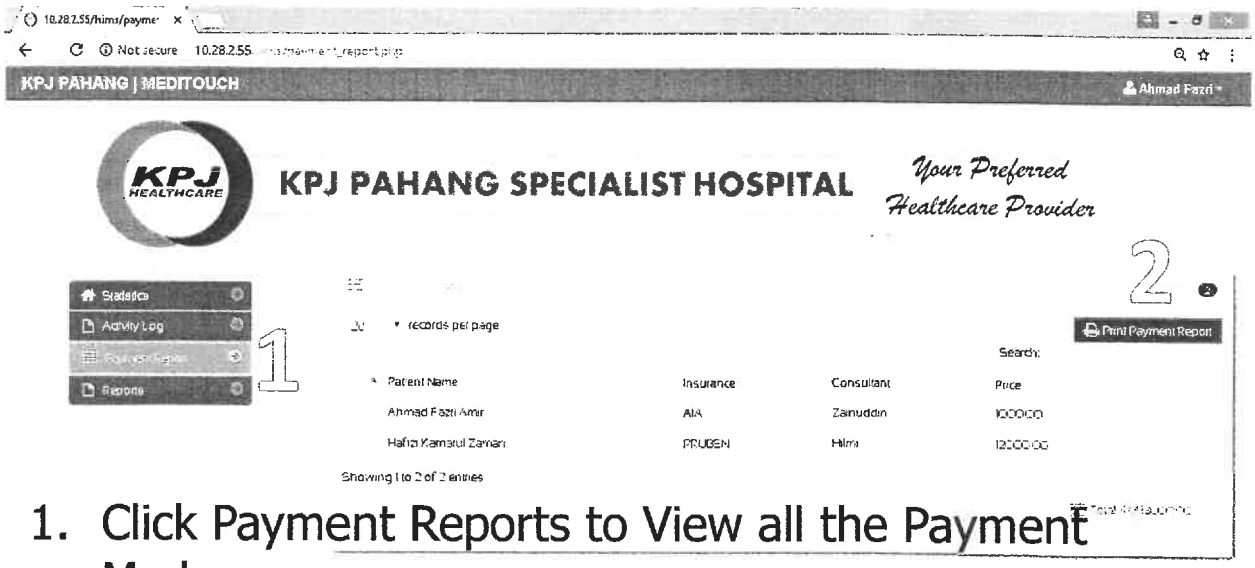
1. Click Reports to View all the Report
2. Click Print to print out all the list

KPJ PAHANG SPECIALIST HOSPITAL

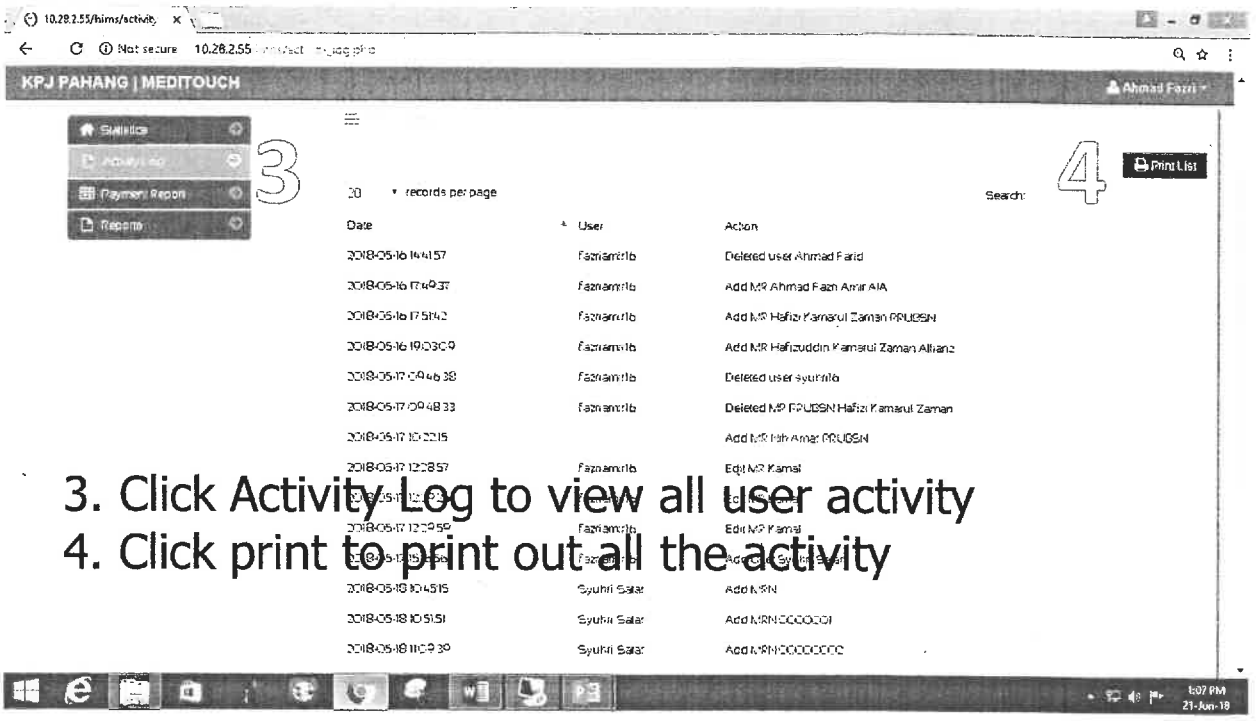
Your Preferred Healthcare Provider

USER MANUAL

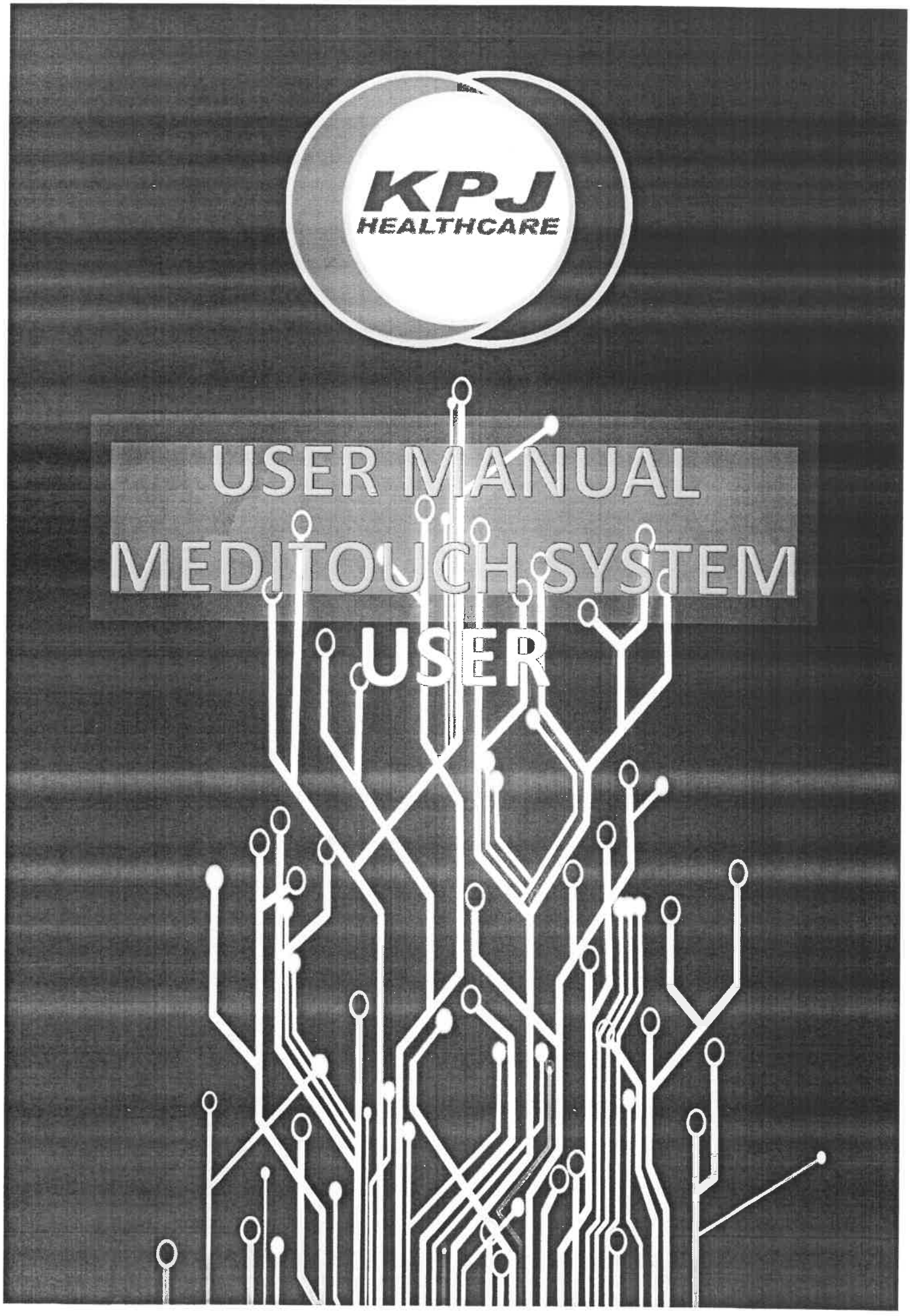
PAYMENT REPORT & LOG



1. Click Payment Reports to View all the Payment Made
2. Click Print to print out all the list



3. Click Activity Log to view all user activity
4. Click print to print out all the activity


KPJ
HEALTHCARE
USER MANUAL
MEDITOUCH SYSTEM
USER

KPJ PAHANG SPECIALIST HOSPITAL

Your Preferred Healthcare Provider

USER MANUAL

LOGIN

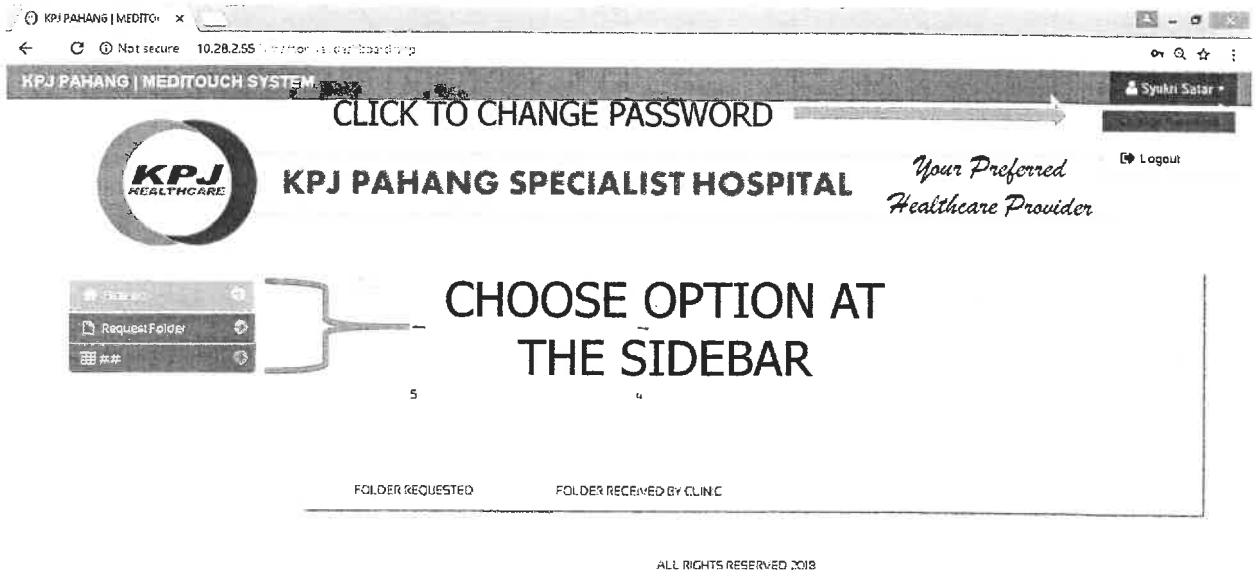
1. Insert System Link = 10.28.2.55/hims
2. Insert your Username
3. Insert your Password
4. Click Login

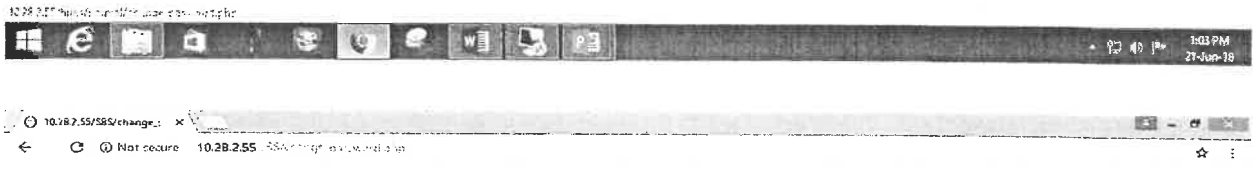
KPJ PAHANG SPECIALIST HOSPITAL

Your Preferred Healthcare Provider

USER MANUAL

HOME





KPJ PAHANG SPECIALIST HOSPITAL

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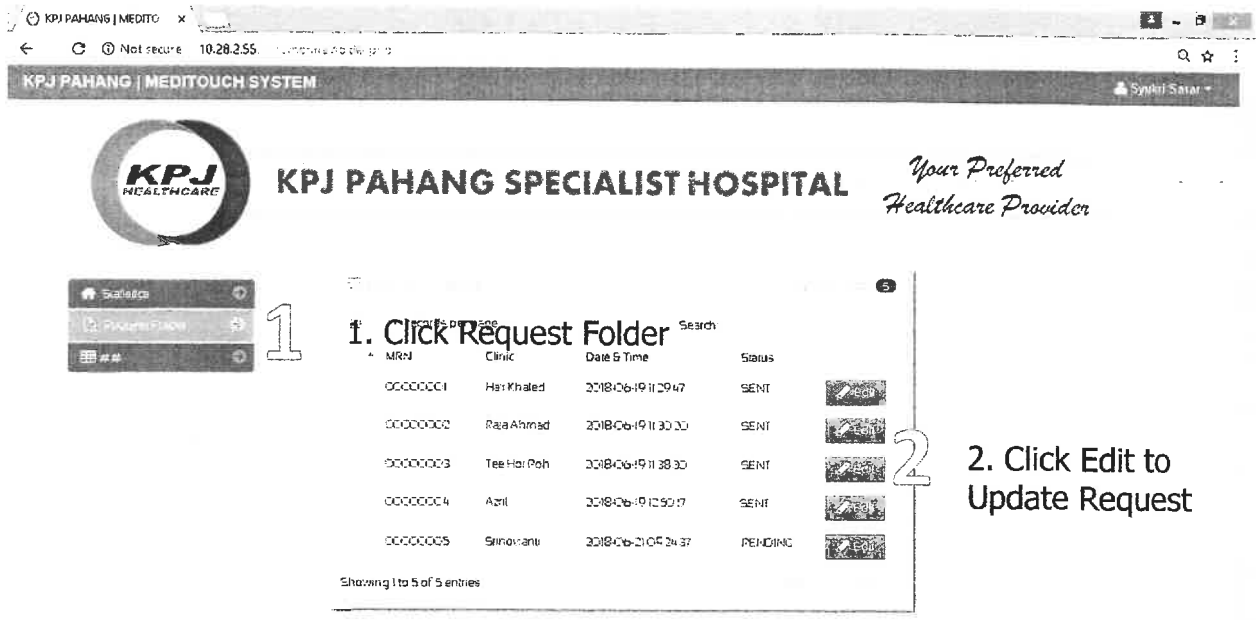
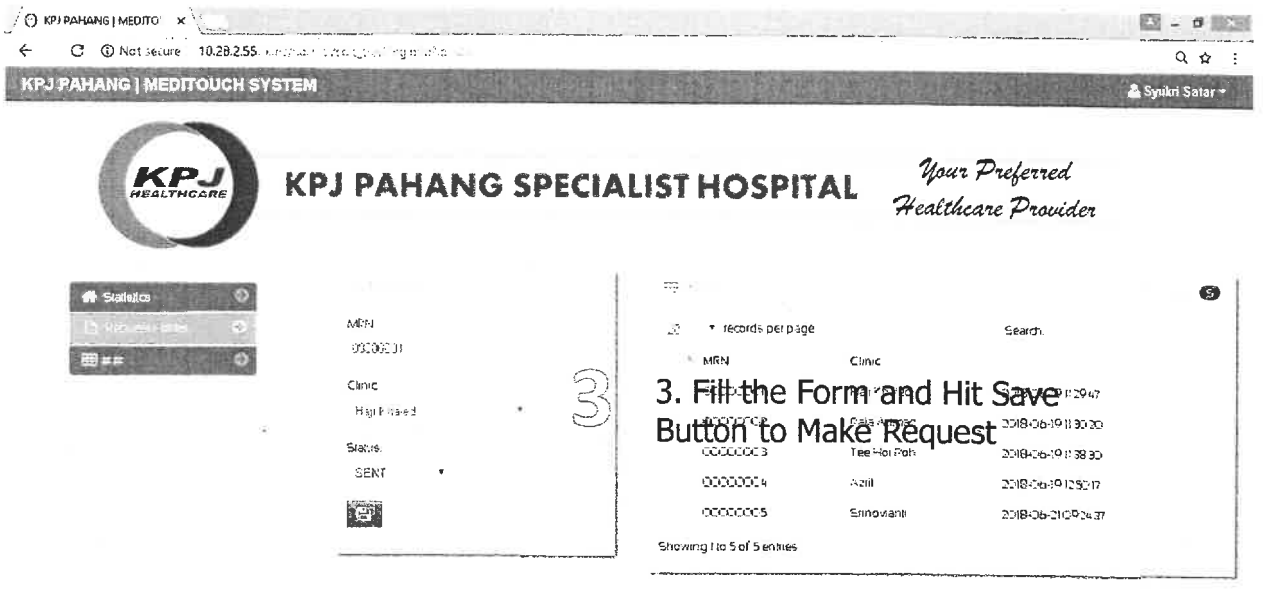
USER MANUAL
FOLDER REQUEST





KPJ HEALTHCARE

Prepared by: Ahmad Fazri Bin Kamarul Zaman

THANK YOU

3.2.26 Maintenance

According to (Alwan, 2015), maintenance is the last phases in system development lifecycle in order for handling the residual errors that may exist in the software even after the testing phase. This phase also monitors system performance, rectifies bugs and requested changes are made. Besides that, maintenance also includes implementation of changes that software might undergo over a period of time, or implementation of new requirements after the software is deployed at the customer location. Once the system are operates in by client, IT Staff must maintain the system to ensure it is fully functioned and there are no problems occurs in the system especially during working time or outside of working time. The system will be fixed by developer if there are bugs or error when the system is used by client. It is important that procedures and guidelines for system maintenance be put in place and followed to avoid the chaos and expense of a system that functions inadequately or no longer serves the business needs for which it was built.

Process provides the guidelines for the long-term enhancement aspect of system maintenance:

i. How to assess and design system upgrades resulting from business changes
ii. How to build and test the upgraded system to assure that it satisfies the new business needs
iii. How to seamlessly transition the upgraded system into the current production environment.

In this phase, the technical support also needed to assist for the maintenance of hardware, software and other technical aspects. Their responsibility includes:

i. Identify hardware, software and server environment.

ii. Install platform software such as PhpMyAdmin and WampServer into Local Server.

iii. Set up technical environment.

iv. Provide technical support for platform software and hardware.

v. Work with the IT Team during testing and configuration of the system.

vi. System backup and recovery (run by IT Staff).

vii. Maintain Database and communication servers.

MediTouch System must be maintained to continually satisfy a client and meet client requirements. There are differences between the methods used in order to maintain hardware and the system itself.

i. Hardware Maintenance

The purpose of maintaining the hardware is to ensure the system can keep running and being process by computer. Hardware is the important equipment to run the system and in order to keep the system running, the hardware also should be maintained by the client by using new specifications of hardware, always run preventive maintenance to the computer and local server.

ii. System Maintenance

System maintenance is directed at maintaining the applications software. Software maintenance includes all modifications of a software product after it has been turned over to operations, and IT Staff should regularly update the software that are related with the server such as windows server, wamp server and others.

CHAPTER 4: CONCLUSION

4.1 Application of Knowledge

While undergoing 5 months of industrial training in Health Information Management Services and Information Technology Services at KPJ Pahang Specialist Hospital, there are a lot of new knowledge that trainee have learnt, regardless of the knowledge which related to our respective course or the knowledge for Information System and Records Management. With the implementation of industrial training, students get to experience the real nature of working environment.

4.1.1 Improve Communication Skills

One of the goals is to reduce my anxiety when talking to strangers. During the placement, trainee was given an opportunity to become frontliner and entertained the customers needed. It is truly believe that this experience has helped the trainee a lot to develop the communication skills since the trainee able to face the crowd without fear and able to speak clearly, thoughtfully and without feeling nervous as what our field practice us to do during our presentation.

4.1.2 Critical Thinking

Critical thinking is one of the skill and ability that trainee able to think clearly and rationally about what to do or take action. Trainee is able to engage in independent thinking by being able to understand and make a problem solving effectively. Trainee understand and able to adapt the logical connections between ideas. The skills that trainee needs in order to be able think critically are varied and include evaluation, observation and decision making.

4.1.2 Literacy Skill

Trainee is exposed to the system of KPJ Pahang such as Medcare System, Health Information Technology Solutions and students are able to use the system to improve understanding.

4.2 Personal Thoughts

4.2.1 Less Possibility of Human Error

The organization should decide to implement EMRs in their facility. The decision to use an EMR system instead of paper records is actually can result in a positive return in the management. This is because it can reduce the possibility of misplaced, mishandling and loss of patients file that can be happen at any organization. Thus, it will also upgrade the recording and reporting of billing services, and decreased billing errors. EMR applications can also boost the quality and safety of patient care. With an EMR system, the staff can identify the past treatment and medication for patients more accurately as the organization will directly linked to all the patient's records related to know if the patient was prescribed any medication from another physician. This is important to avoid any mistake in giving unsuitable treatment and medicine to the patients. They can also immediately know each patient's medical problems and any allergies they may have. With such detailed information available at the fingertips, the staff can more easily give the patients the safe, efficient and personalized care that they deserve without any careless.

4.2.2 Improving Patient Care

EMR systems were specifically designed to help patients to become involved and close in the health care process. Usually it is contains information about the care provided during the visit, medications prescribed, follow-up appointments and related medical advice that need to be looking forward. The objective of the summary is to make the hospital and staff more aware of what occurred during the visit and how they can assist in patient care. Using EMR systems, the management either doctors or nurses can quickly and easily receive electronic copies of their healthcare information upon request. Malaysia is adapting the hospital-based management where the records need to be kept in hospital rather than be keeping by the patient. Since that, every hospital in Malaysia are mostly keeping more than a thousand of

patients records that they need to look for, review and preserve for some purposes. Hence, it is clear that the use of EMR System is very helpful and productive in improving the patient care.

4.3 Lesson Learnt

4.3.1 Customer Service Awareness

In handling customer application it is not always be going smooth. From time to time, trainee has learned and improves my understanding towards the task given. In this case, priority is given to the customers by helping out them to make an application, explaining to them the procedures and delivered them with the right information at the right time. The courses such as Standard People Practices have taught trainee a lot.

4.3.2 Explore the system used

Trainee was exposed to various type of system used in KPJ Pahang Specialist Hospital. Trainee was able to work with the team to ensure that every aspect that need to be computerized to the system run smoothly.

4.3.4 Multi-tasking

Trainee had to be very critical and precise with what trainee was doing in daily routine during the placement. Trainee was allowed to participate in a few projects and help coordinate tasks for various jobs specification. Hence, the opportunities to learn the procedures and responsibilities also have expanded the life-long knowledge.

4.4 Limitation and Recommendation

Challenges and problems are common in management. However, knowing the challenges and problems at the early stage may avoid some consequences as to prepare for the unexpected situations. With some careful planning, these challenges are able to be overcome. Since Medical Record Unit is not yet relies on stable position where they still need more training and more recommendations in their organization. Based on the observation, it is found and determine some cons that might be faced by their organization regarding to its repository storage area, the number of staff, the ways in handling system, preservation and conservation method and other task regarding to the filing system.

4.4.1 Strategy plan for better service and storage

In dealing and managing the medical records, the organization also needs trap some strategy approach that need to be taken as the earlier awareness for an organization to be used in current and the future. The awareness must be on-going process from time to time so that the staffs were alert and be more careful in handling the records so that the better service will be served. The storage should be plan better by adding or make a proper plan to manage the active and semi-active. This may be the best solution however it cannot be denied that this strategy is not easy as to deal with the environment is toughly hard and sometimes the conflict becomes the barrier to the records unit to achieve their mission. As it is to approach a better storage, it is important to be focused on the right strategy to be implemented from time to time from the upper level management.

4.4.2 Management of staff awareness

The majority of this problem is that fail in handling the committee roles because of lack of awareness. This is because the management usually not really exposed to the consequences in breaches the health information. Based on thinking, instead of only guiding the carer of records from being careless it is also important to cooperate and develop a special security committee that are specifically guiding the whole process and management of keeping medical. Good staffs also need to have knowledge and skills in encountering the problems in managing the system and management which is the system down maybe occur. Since that, the preparation must be acknowledge by the staff to avoid any mistakes.

4.4.3 Digitizing the medical records

The development of technology has challenged the global organization especially the hospital as the greatest threat in the form of managing their records for accessibility. Keeping the records electronically is just close related to the activity of digital preservation that aims to ensure that their collection remain usable, regardless of the inevitable changes in technology the future will bring. The successfulness are totally depending on how the hospital can implement and practice the right way of keeping, preserving and at the same time to deal with technology. The staffs needs to have a professional practice by facing the right theory and practice in making use the electronic devices for preservation purpose and to limit the storage. The example of the theory is on how they learn and determine the facts and the

procedure in managing records and technology at the same time. Meanwhile, the practice is the act where they use their ability to do it the task in a right manner.

5.0 Conclusion

With all the means, all discussion and issues that have been stated regarding to the medical records management in health field, the individual or organization should be aware and plays the important role by applying appropriate approach embraces accurate techniques, planning and selecting the best way to overcome the problems and issues. It is clearly an effective method to ensure their authenticity, reliability, and long-term accessibility for the future generation. Industrial training like this is actually can strengthens the skills and knowledge of students in the field of Information System Management, Minor in Records Management. Application of the theories in classes with co-workers, team work, decision making, practice a problem-solving and delivery of accurate information were among meaningful experience gained. Other than that, the requirement for a student to complete a special project task and preparing a technical report enhances critical and analytical thinking of the students which is essential in fulfilling industry expectation

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APPENDIX A: UAT TEST FORM

1. UAT TEST PROCEDURE (ADMIN)

The following section describes the detail test steps and test result of system in KPJPHG IT Infrastructure Implementation Project

1.1 MEDITOUCH SYSTEM KPJ PAHANG

Location:	KPJ PHG Level 4 Server Room Server: 10.28.2.55
Test Objective:	To validate the System (MediTouch) is configured with the services functioning properly

Test No.	Test Description	Test Procedures	Expected Result	Test Results	Remarks
1.	Login Test	i. Verify Server Sangfor functionality working and can be reach ii. Launch Web Browser, under address bar, fill in server IP "10.28.2.55"/hims, login using username and password	Login Success	☑ Pass ☐ Partial ☐ Fail	
2.	Change Password Test	i. Choose Change Password option at navigation Bar ii. Fill Current Password, New Password and Verify New Password	User Able to Change Password	☑ Pass ☐ Partial ☐ Fail	

3.	Add New Medical Report	i. Click Medical Report at System Sidebar ii. Click Add MR	User/Admin are able to add new medical report	☑ Pass ☐ Partial ☐ Fail	
4.	Folder Tracking	i. Click Folder Tracking at System Sidebar ii. Click Add New MRN	User/Admin are able to add new medical record number	☑ Pass ☐ Partial ☐ Fail	
5.	Folder Request	i. Click Folder Request at System Sidebar. ii. Hit yellow button to update folder "sent"	User/Admin are able to update and view the folder request from clinic	☑ Pass ☐ Partial ☐ Fail	
6.	Medical Report Payment	i. Click MR Payment at sidebar ii. Click Pay to update patient payment details	User/Admin are able to view unpaid medical report and update paid medical report	☑ Pass ☐ Partial ☐ Fail	

7.	Users	i.	Click User add sidebar, and fill user form to add new user	User/Admin are able to add new user	☑ Pass ☐ Partial ☐ Fail	
8.	Report	i.	Click Report at sidebar	User/Admin are able to view payment report, medical report total, activity log, and medical report completed within before 2 weeks and after 2 weeks after date requested	☑ Pass ☐ Partial ☐ Fail	

2. UAT TEST PROCEDURE (USER)

The following section describes the detail test steps and test result of system in KPJPHG IT Infrastructure Implementation Project

2.1 MEDITOUCH SYSTEM

Location:	KPJ PHG Level 4 Server Room Server: 10.28.2.55
Test Objective:	To validate the System (MediTouch) is configured with the services functioning properly

Test No.	Test Description	Test Procedures	Expected Result	Test Results	Remarks
1.	Login Test	i. Verify Server Sangfor functionality working and can be reach ii. Launch Web Browser, under address bar, fill in server IP "10.28.2.55"/hims, login using username and password	Login Success	☑ Pass ☐ Partial ☐ Fail	
2.	Change Password Test	i. Choose Change Password option at navigation Bar ii. Fill Current Password, New Password and Verify New Password	User Able to Change Password	☑ Pass ☐ Partial ☐ Fail	

3.	Add new folder request	i. Click Folder Request at system sidebar ii. Fill the Form	User are able to submit new folder request to Medical Records	☑ Pass ☐ Partial ☐ Fail	
4.	Check Status	i. Click Status at system sidebar ii. View status at the status table	User are able to view request status	☑ Pass ☐ Partial ☐ Fail	
5.	Log Out	i. Click logout at system navigation bar	User are able to end the session	☑ Pass ☐ Partial ☐ Fail	