

## About "Systematic Training Programme & Certification for Healthcare and IT Practitioners"

"Systematic Training Programme & Certification for Healthcare and IT Practitioners" ("STPC") is one of the latest training initiatives of eHealth Consortium, sponsored by the eHealth Record Office of Food and Health Bureau, under the scheme of "eHR Engagement Initiative (EEI)" in November 2010.

eHealth Consortium ("eHC"), the organizer of STPC, aims to infuse 700 members of eHealth stakeholders (Healthcare/IT Professionals, Practitioners and Executives) with essential eHealth understandings and hands-on skills. STPC consists of three courses:

1. "eHealth Awareness Course for eHealth Practitioners"
2. "eHealth Training for eHealth Executives"
3. "Proficiency Training for eHealth Professionals"

eHealth Consortium would like to thank all course facilitators and participants for their support in ehealth.

## About the Organizer

Established since 2005, eHealth Consortium ("eHC") is one of the major non-profit making organizations in Hong Kong leading ehealth advocacy in the region and we are the prime agency bridging healthcare and IT industries to advance the development of eHealth in Hong Kong and Mainland China. Over the years, our efforts are focused on three key areas, namely data standardization, education and capacity building, and facilitating pilot projects for the advancement of eHealth applications. We work closely with the healthcare and the ICT sectors to offer training programs, conferences, and seminal events for ehealth stakeholders.

As of February 2011, eHC is an organization of 25 Corporate Members, 18 NGO Members and over 250 Individual Members from healthcare and IT.

For more information about eHC, please visit [www.ehealth.org.hk](http://www.ehealth.org.hk).



## **CLINICAL MANAGEMENT SYSTEMS OVERVIEW**

**DR. GOLDEN WONG SHU KAI**

**Steering Committee Member of  
Wuhan Project of Hong Kong  
Medical Association**

**2011**



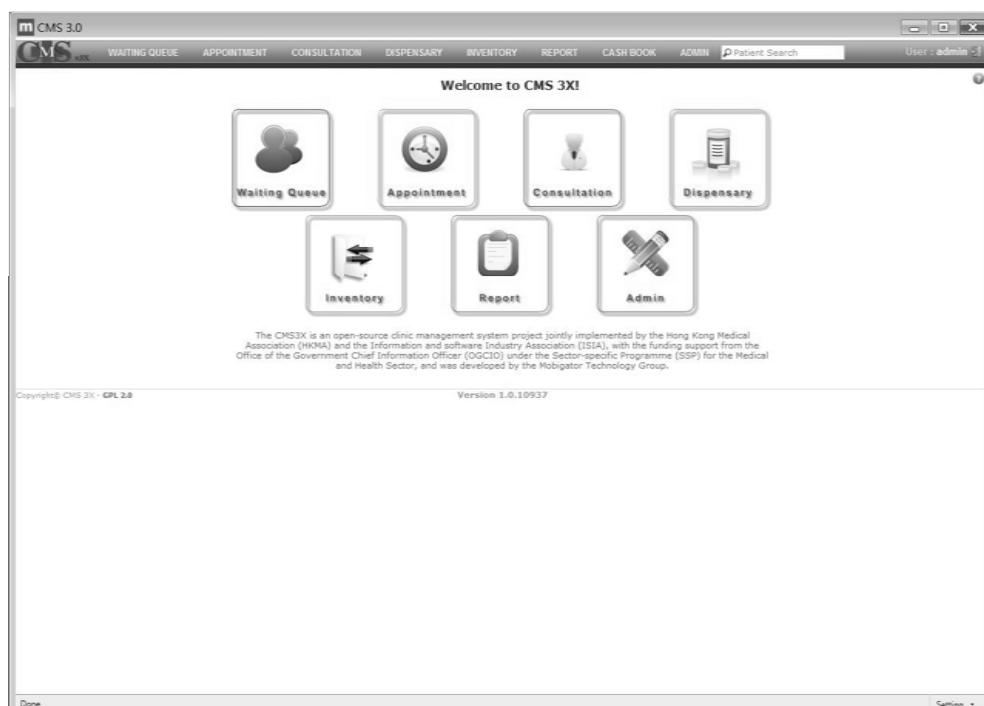
## **TOPICS**

- What are available in the Market?
- How to choose solutions that best fit our needs?

## A) WHAT ARE AVAILABLE IN THE MARKET?

1. HA CMS
2. DH CMS on ramp
3. HKMA CMS 3X
4. HKDU CMS 1.2
5. winMed Professional
6. MediKAre
7. Clinic Solution
8. Others...

## HKMA CMS 3X

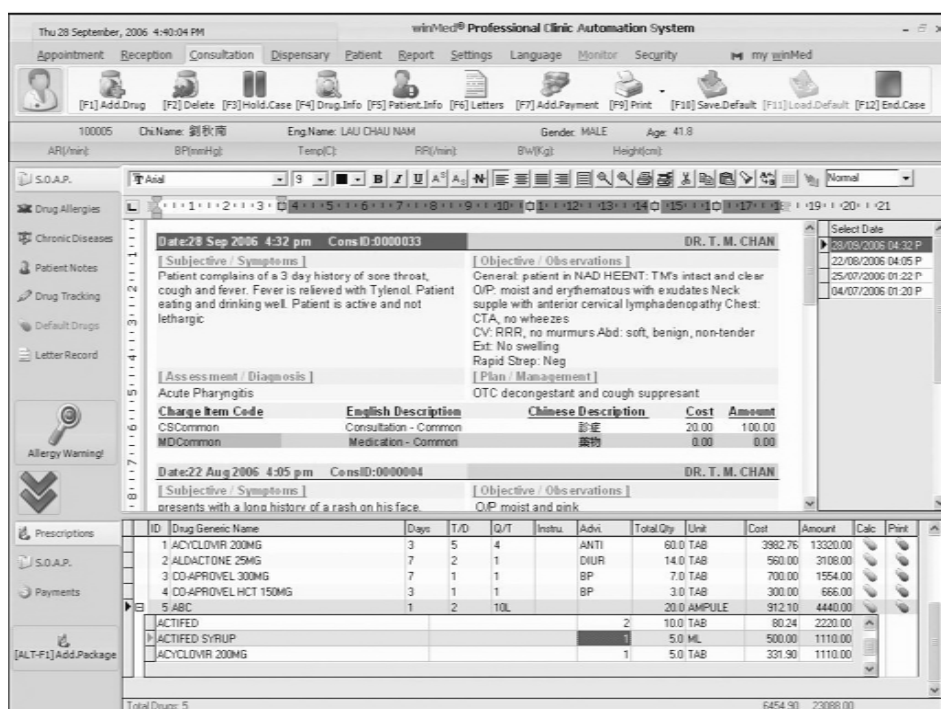


# HKDU CMS 1.02



Source from LX1 by courtesy

# WINMED



Many, many, many  
MORE!

b) But then,  
how to choose?

## Considerations

- 1) What do you want?
- 2) What does the solution offer?

- 1) What do you want?

Uniqueness of CMS over other  
systems

*LIFE-LONG*

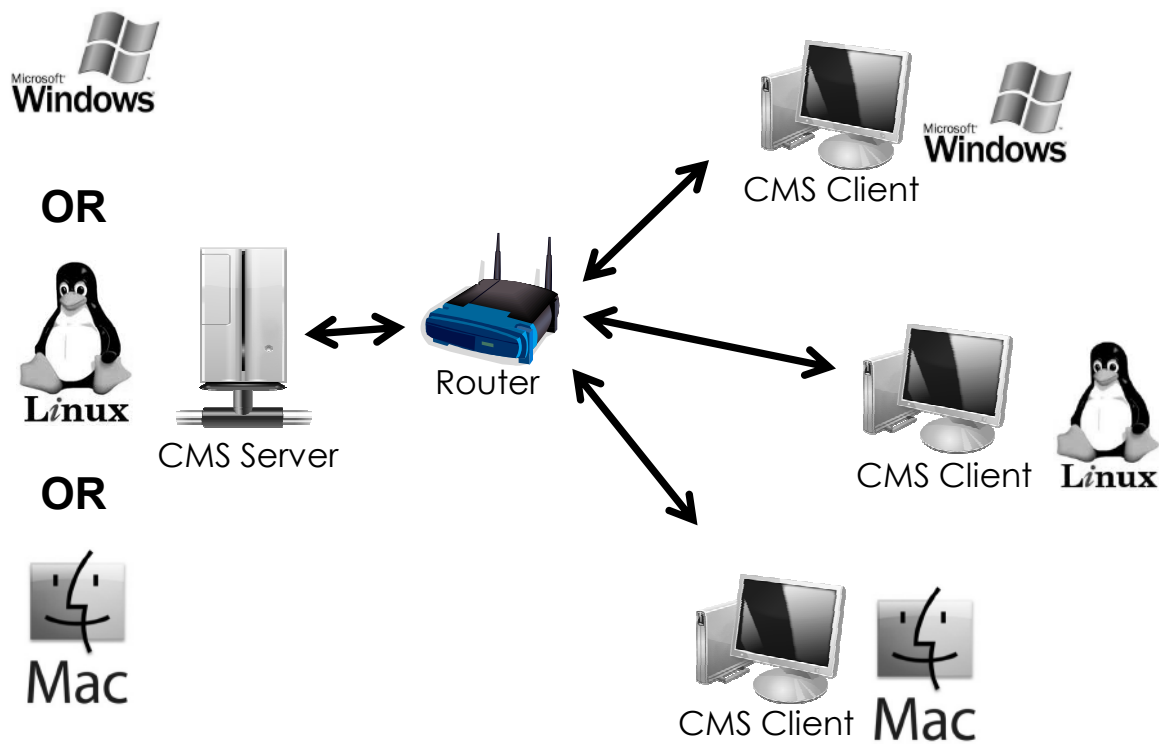
## 2) WHAT DOES THE SOLUTION OFFER?

- |                                    |  |
|------------------------------------|--|
| 1. Subscription? Monthly fee?      | 21. Security?                            |
| 2. Efficient support?              | 22. User level defined clearly?          |
| 3. Easy installation?              | 23. Back-up easy?                        |
| 4. User-friendly?                  | 24. Data migration easy?                 |
| 5. Stable and powerful database?   | 25. Solo/large group flexibility?        |
| 6. Can be upgraded?                | 26. Report generation?                   |
| 7. Web-based?                      | 27. Can upload lab reports, x-ray films? |
| 8. Cross-platform?                 | 28. Links to HA, DH, CENO, PPI???        |
| 9. Source opened for modification? | 29. How about my old paper records????   |
| 10. Standardized data format?      | 30. future???                            |

## PLATFORM COMPATIBILITIES

- Windows dependant
- Mac OS dependant
- Linux dependant
- Crossed
  - Windows + Mac OS
  - Windows + Linux
  - Windows + Mac OS + Linux ...

# MULTI-PLATFORM SETUP



## SOLUTION SHOULD MEET YOUR

1. Daily workflow
2. Daily, monthly and yearly reports
3. Any additional features that suit your setting



## FEES!

- LICENSE for software, plug-ins, database
- SUBSCRIPTION
- MONTHLY
- YEARLY
- NEXT YEAR?
- NEXT, NEXT YEAR?
- What service is included in fees

## SUPPORT

- Learning kits –setup, orientation of CMS
- Technical
  - over the phone
  - on site
  - remote control
- Efficient
- Hardware support

## MAINTAINENCE

- UPGRADE of CMS
- UPGRADE to match new versions of Windows, Apple, Linux etc
- Compatibilities with printers and peripherals
- Compatibilities of Database
- VENDOR life-long support?

## DATA MIGRATION

1. From old paper records to electronic records
2. From one CMS to another CMS

# DATA MIGRATION

- From old paper records to electronic records



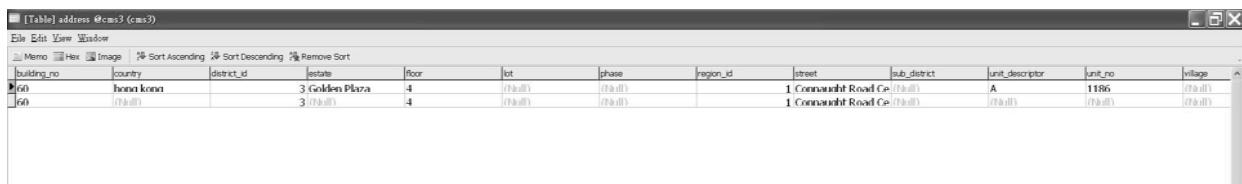
# DATA MIGRATION

- From one CMS to another CMS

<ul style="list-style-type: none"> <li>files</li> <li>#WS</li> <li>mtg_bill_detail_view</li> <li>mtg_dangerous_drug_view</li> <li>mtg_diagnosis_alert_view</li> <li>mtg_drug_expiry_report_view</li> <li>mtg_drug_inv_reple_view</li> <li>mtg_drug_report_view</li> <li>mtg_income_and_expenditure_view</li> <li>mtg_medical_card_billing_report</li> <li>mtg_prescription_detail_view</li> <li>mtg_resource_usage_view</li> <li>red Procedures</li> <li>mts</li> <li>ries</li> <li>ation_schema</li> </ul>	<ul style="list-style-type: none"> <li>address</li> <li>address_area</li> <li>address_district</li> <li>advisory</li> <li>appointment</li> <li>audit_log</li> <li>bill</li> <li>bill_detail</li> <li>bill_template</li> <li>bill_template_detail</li> <li>calendar_schedule</li> <li>cashbook</li> <li>ceno_disease</li> <li>ceno_disease_type_enum</li> <li>ceno_record</li> <li>ceno_user</li> <li>certificate</li> <li>charge_item</li> <li>classification</li> <li>classification_archive</li> <li>clinic</li> <li>clinic_setting</li> <li>clinic_setting_customized_field</li> <li>common_dosage</li> <li>common_template</li> <li>consultation_notes</li> <li>consultation_template</li> <li>customized_field</li> <li>customized_field_category</li> </ul>	<ul style="list-style-type: none"> <li>encounter_type</li> <li>grid_order</li> <li>human_relationship</li> <li>in_config</li> <li>in_user</li> <li>instruction</li> <li>integrated_service</li> <li>integrated_service_js_code</li> <li>integrated_service_json</li> <li>integrated_service_label</li> <li>integrated_service_long_label</li> <li>integrated_service_store</li> <li>integrated_service_string_pair</li> <li>inventory</li> <li>inventory_import_temp</li> <li>inventory_item</li> <li>inventory_item_archive</li> <li>inventory_item_supplier_manufacturer</li> <li>inventory_movement_log</li> <li>jsec_permission</li> <li>jsec_permission_alias</li> <li>jsec_role</li> <li>jsec_role_permission_rel</li> <li>jsec_user_permission_rel</li> <li>jsec_user_role_rel</li> <li>language_enum</li> <li>letter</li> <li>login_log</li> <li>master_drug_list</li> </ul>	<ul style="list-style-type: none"> <li>queue_status_enum</li> <li>quick_menu</li> <li>received_item</li> <li>referrer</li> <li>request</li> <li>request_item</li> <li>resource</li> <li>sequence_number</li> <li>sex_enum</li> <li>state_provider</li> <li>supplier_manufacturer</li> <li>template_type</li> <li>test</li> <li>user</li> <li>user_profile</li> <li>user_profile_customized_field</li> <li>vital_sign</li> <li>vital_sign_customized_field</li> <li>waiting_queue</li> <li>waiting_queue_callback_record</li> <li>waiting_queue_group</li> <li>waiting_queue_priority</li> <li>waiting_queue_resource</li> <li>xml_service</li> </ul>
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# DATA MIGRATION

- Difficulties arise when one CMS has data fields different from another CMS, eg. Address, patient entry, reference number, internal markers



building_no	country	district_id	estate	floor	lot	phase	region_id	street	sub_district	unit_descriptor	unit_no	village
60	hong kong	3	Golden Plaza	4	(null)	(null)		1 Connaught Road Ce	(null)	A	1186	(null)
60	(null)	3	(null)	4	(null)	(null)		1 Connaught Road Ce	(null)	(null)	(null)	(null)

Source from HKMA by courtesy

# SOURCE CODES

- Open
  - easy to modify, flexible, upgrade
- Closed
  - vendor to modify
  - can external engineer modify???

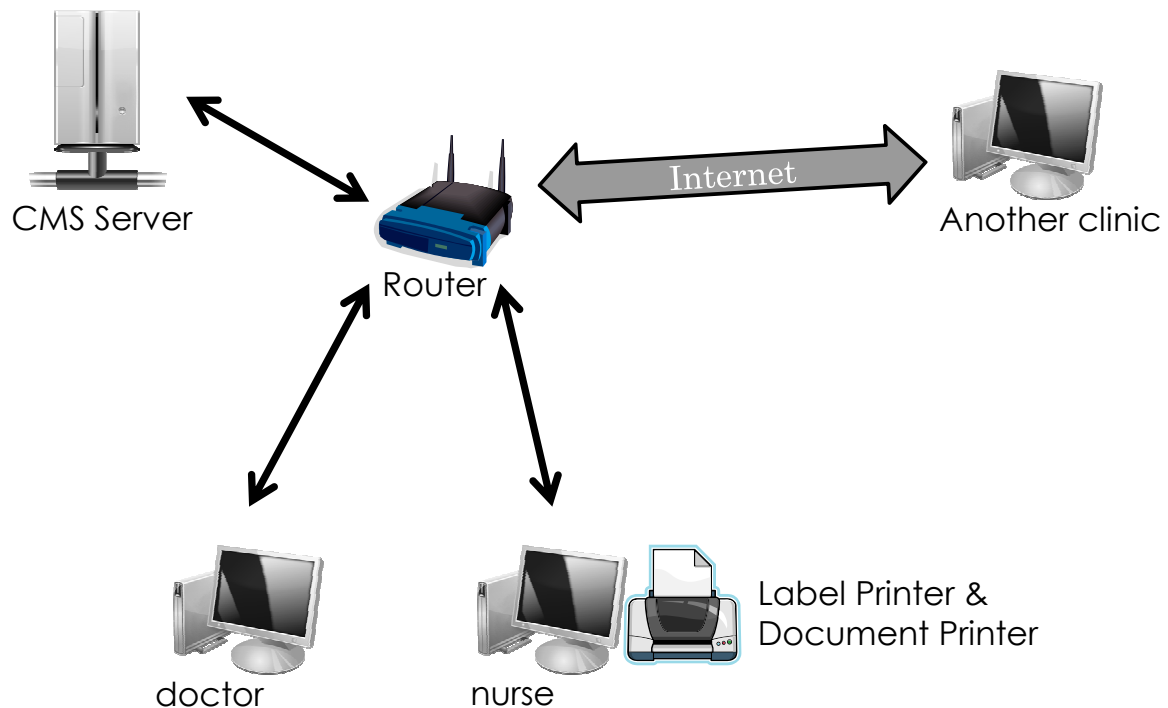
## MATCHES WITH NEEDS

- Security
  - User Level Definition
    - administrator, doctor, nurse, dispenser,
    - cashier, accountant etc
- SINGLE or MULTIPLE Users
- Office, Department or Regional based
- Database Capacity
- User-Friendly, fast
- Standardized data format
- Backup efficiency and reliability

## SECURITY

- SSL (secure socket layer) mode in data transfer – LAN, internet (https)
- Data Encryption in backup
- Password protection of solution  
of database
- User roles definition eg. Admin, doctor, nurse

## SECURITY-SSL MODE, HTTPS

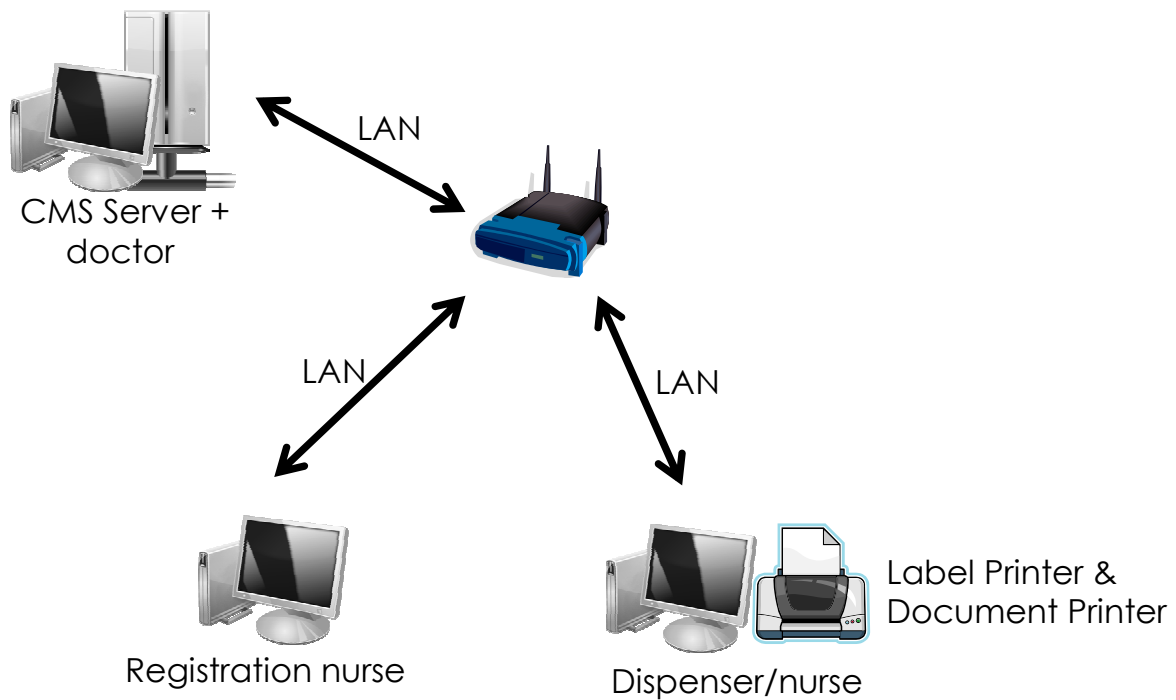


## SINGLE OR MULTIPLE USERS

- Single user



- Multiple users (usually)

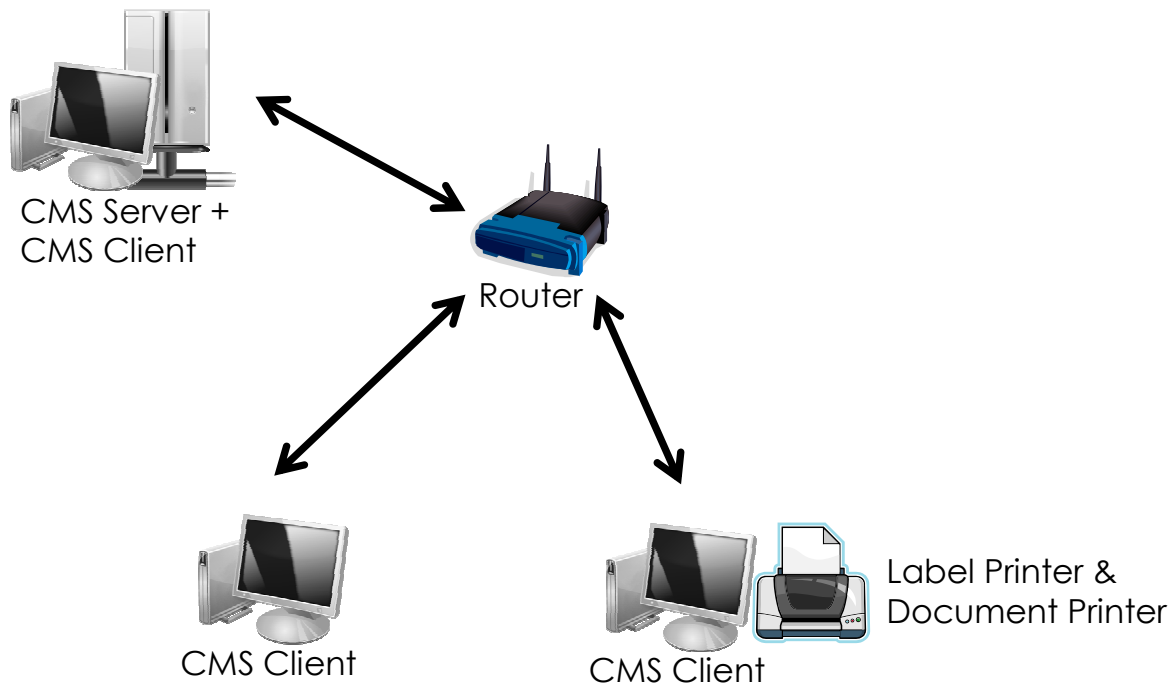


## OFFICE BASED

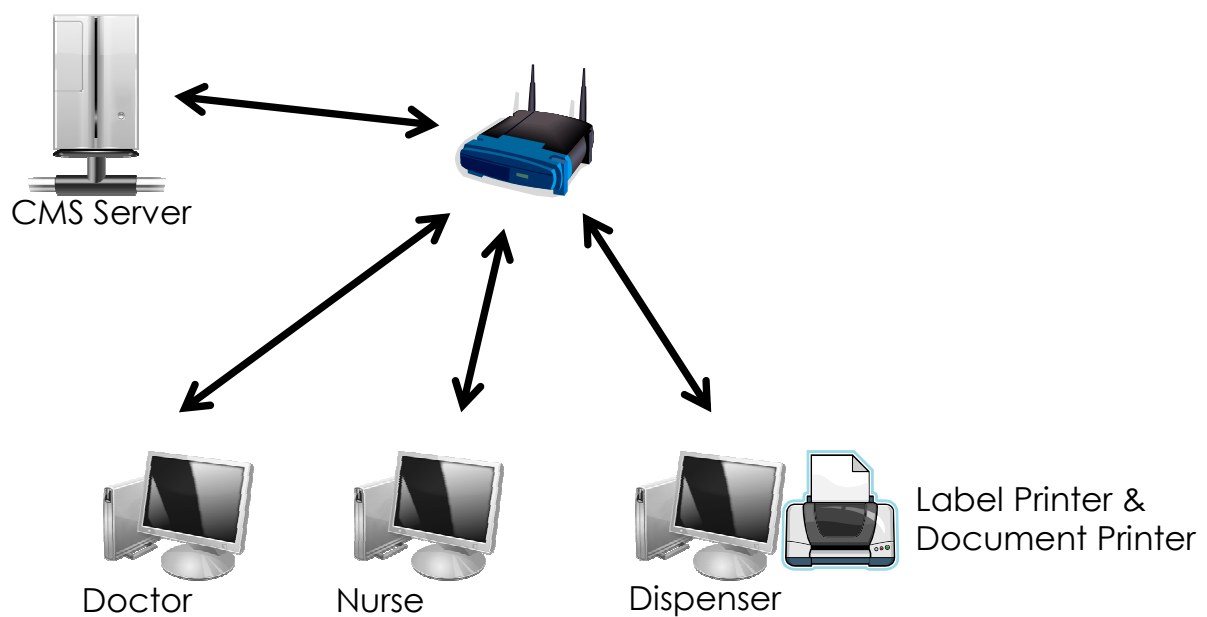
- Server and Client on the same computer



- Server and Client on the same computer
  - Additional Clients on LAN



## DEPARTMENT-BASED

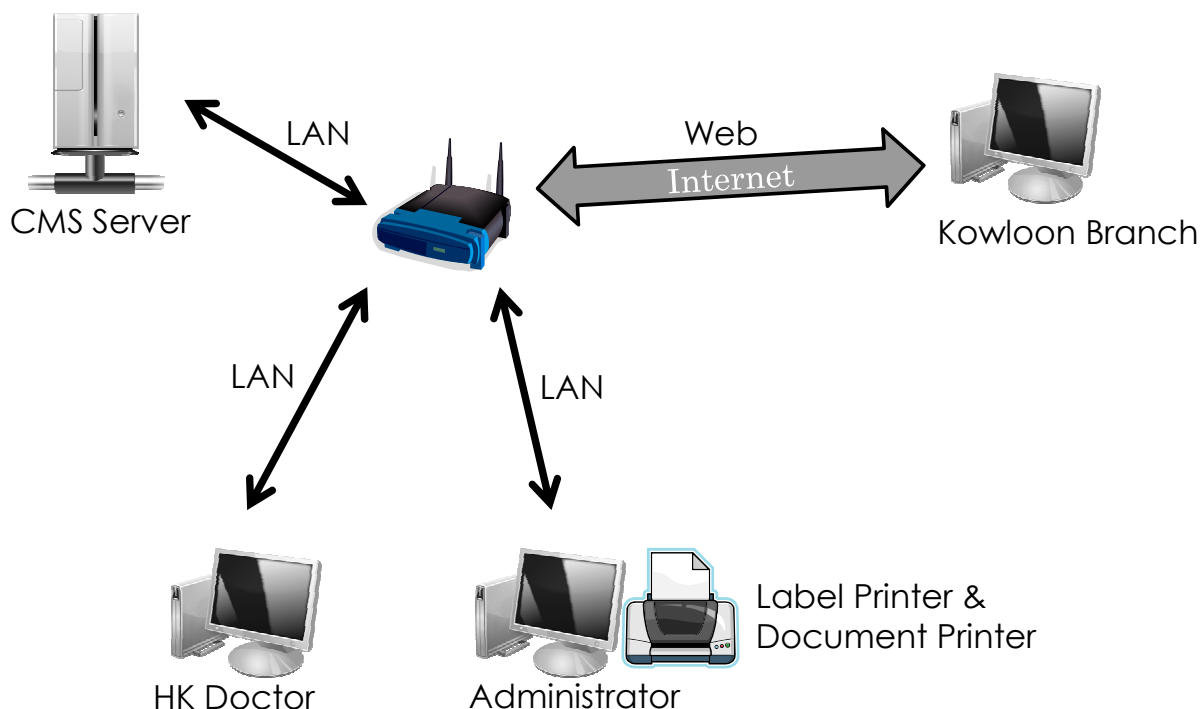




## REGIONAL WEB-BASED

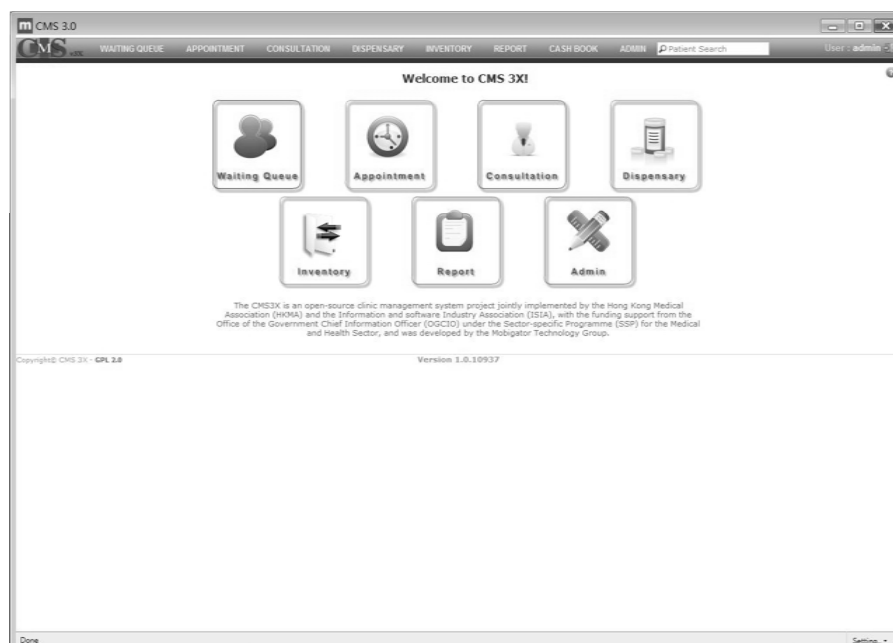
### ◦ Dedicated Server and multiple Clients on LAN

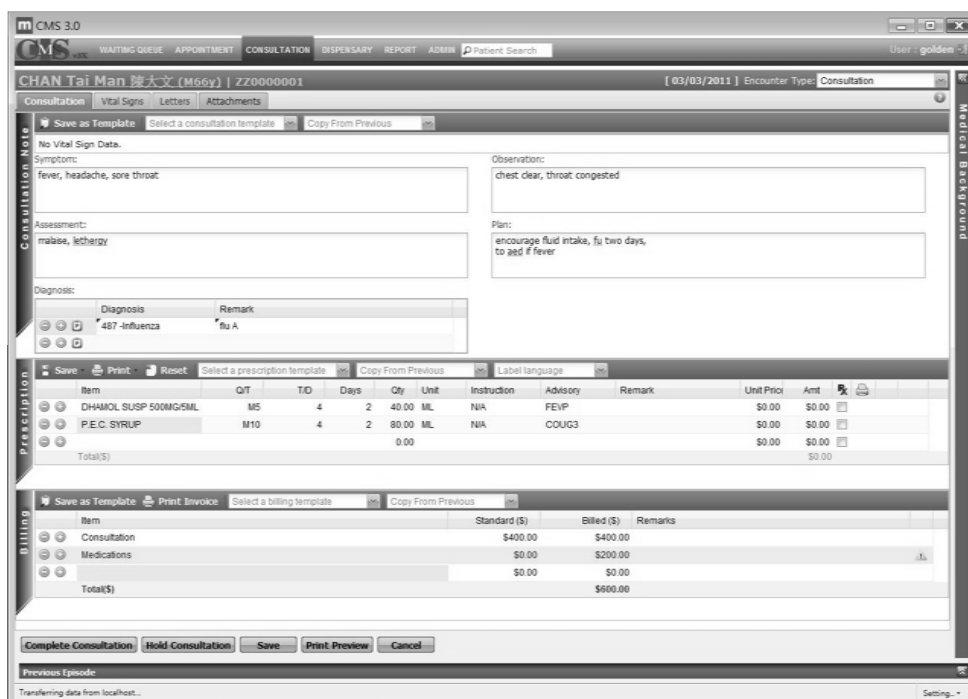
- Remote Client through the Internet



## USER-FRIENDLY INTERFACE

### ◦ HKMA CMS 3X





**Consultation Note**

Symptoms: fever, headache, sore throat

Assessment: malaise, lethargy

Diagnosis: 487-Influenza

Observation: chest clear, throat congested

Plan: encourage fluid intake, fu two days, to sed if fever

**Prescription**

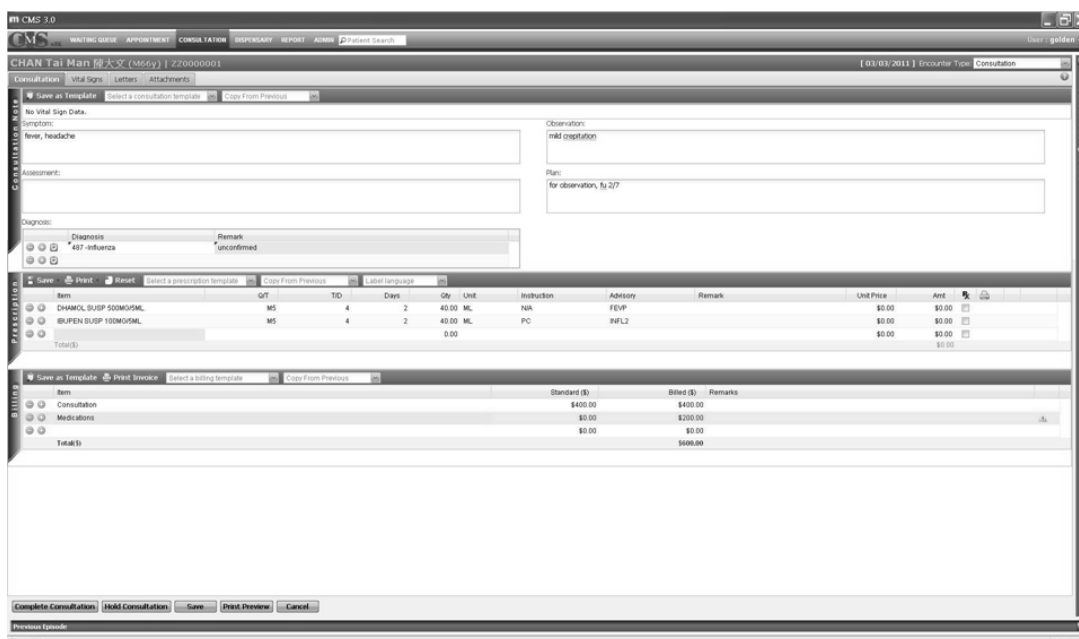
Item	QTY	TD	Days	Qty	Unit	Instruction	Advisory	Remark	Unit Price	Amt
DHAMOL SUSP 500MG/5ML	M5	4	2	40.00	ML	N/A	FEVP		\$0.00	\$0.00
P.E.C. SYRUP	M10	4	2	80.00	ML	N/A	COUG3		\$0.00	\$0.00
Total(\$)									0.00	\$0.00

**Billing**

Item	Standard (\$)	Billed (\$)	Remarks
Consultation	\$400.00	\$400.00	
Medications	\$0.00	\$200.00	
Total(\$)	\$0.00	\$600.00	

Source from HKMA by courtesy

## AUTO-SIZE AND RESOLUTION ARE CONCERNS



**Consultation Note**

Symptoms: fever, headache

Assessment:

Diagnosis: 487-Influenza

Observation: mild copulation

Plan: for observation, fu 2/7

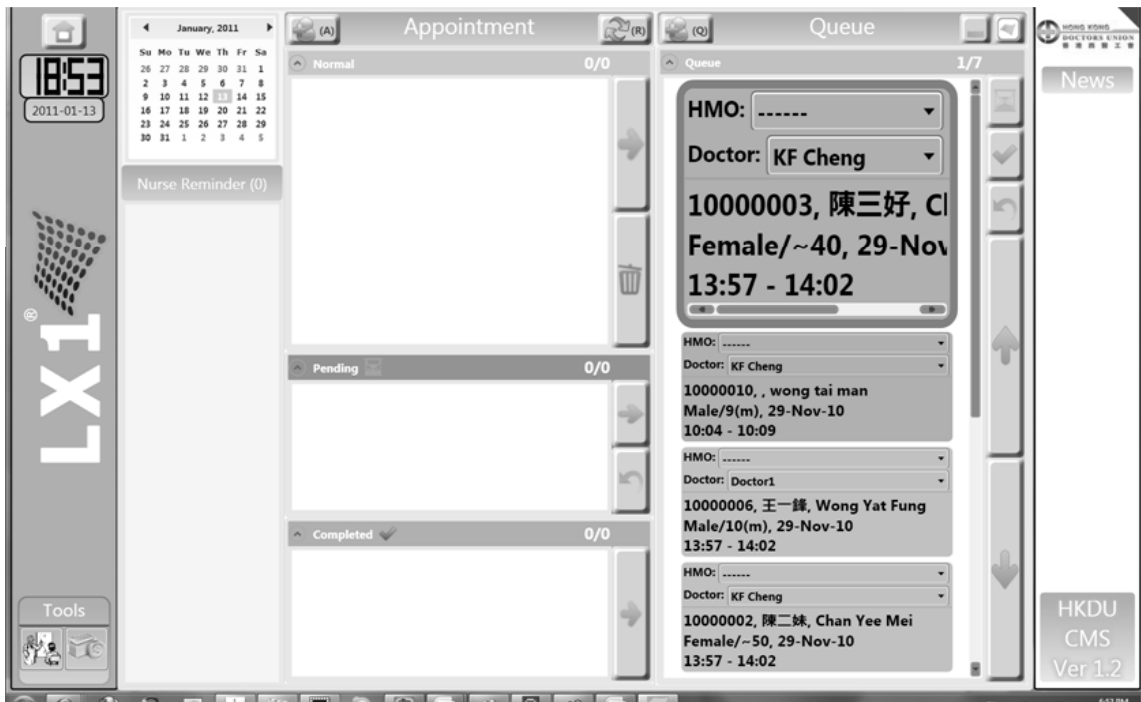
**Prescription**

Item	QTY	TD	Days	Qty	Unit	Instruction	Advisory	Remark	Unit Price	Amt
DHAMOL SUSP 500MG/5ML	M5	4	2	40.00	ML	N/A	FEVP		\$0.00	\$0.00
GLUPEN SUSP 100MG/5ML	M5	4	2	40.00	ML	PC	RFL2		\$0.00	\$0.00
Total(\$)									0.00	\$0.00

**Billing**

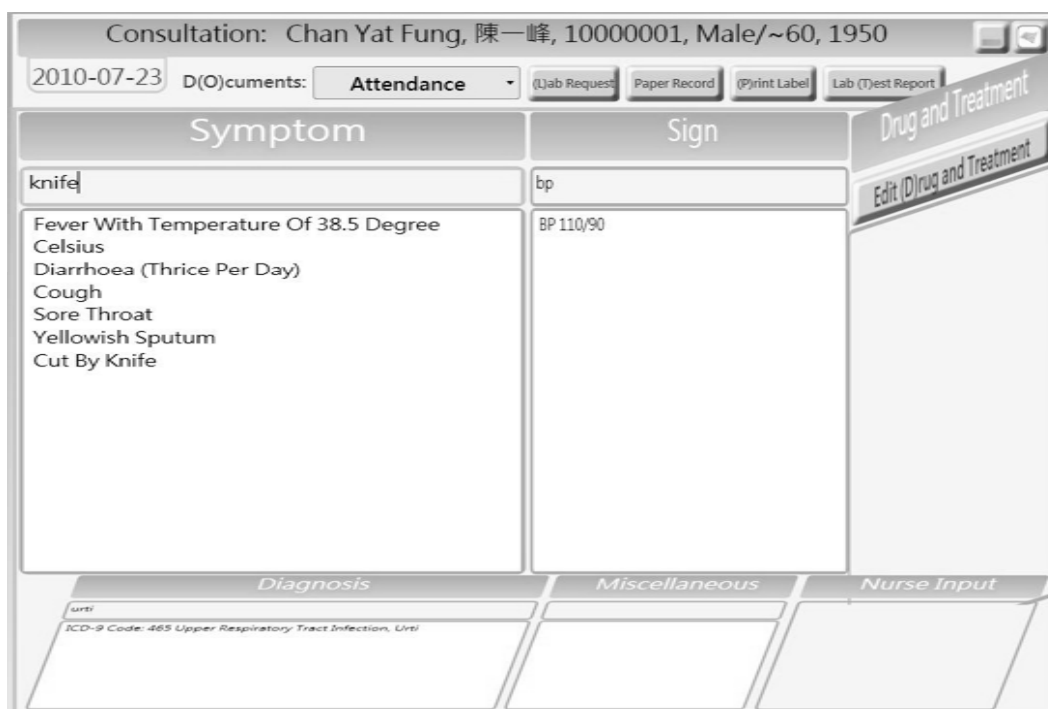
Item	Standard (\$)	Billed (\$)	Remarks
Consultation	\$400.00	\$400.00	
Medications	\$0.00	\$200.00	
Total(\$)	\$0.00	\$600.00	

## HKDU CMS 1.2



Source from LX1 by courtesy

## HKDU CMS 1.2



# WINMED PROFESSIONAL

Tue 16 March, 2010 4:44:04 PM

winMed® Professional Clinic Automation System

Appointment Reception Consultation Dispensary Patient Report Settings Language Monitor Security my winMed

[F1] Add Patient [F2] Modify Patient [F3] Delete Patient [F4] Search Patient [F5] Patient Details [F6] Patient History [F7] Print Patient Label

Patient List

[F11] to ch English

English Name

LAU MING TIN  
MAK SU MEI  
WONG MA LEE  
TSUI TIN TIN  
LAM TONG  
LAM SU SI  
LAU LING LING  
TAM WAI CHU  
CHEUNG MEI Y  
LAU CHAU NAM  
LAU YAT KIT  
HO YUEN YUEN  
MA SU SU  
LAM DAI MING  
LEUNG AH MEI

Patient No: 100003 Reg Date:

Patient Details

Last Name: TSUI First Name: TIN TIN Nickname:

Chi Name: 徐天 Tin Tin Occupation: INFORMATION TECHNOLOGY

I.D.: K105646(1)

D.O.B.: 02/07/1974 Age: 35.7

Address: UNIT 512, 5/F, ENTERPRISE PLACE (BUILDING 9), NO. 5 SCIENCE PARK, SHATIN, NEW TERRITORIES

Gender: MALE Status: Married Blood:

Payment: CASH Lang: Chinese email: info@clinicideas.com

Mobile: Tel: 26869190 Pager: Fax: 26869364

Education: Custom: Emergency: Contact: Ref. Source: Remarks:

Medical Insurance Cards (Press <INS> to add, <CTRL-DEL> to Delete)

Payment Item	Card/Policy Number	Expiry Date	Amount	Cost
AIA Green Card	987612345	16/03/2010	100.00	50.00

Family (Press <INS> to add, <CTRL-DEL> to Delete)

Patient No	English Name	Chi Name	Relationship
100001	LEUNG AH MEI	梁阿美	MOTHER

[F9] Update [F12] Close

Add Card Delete Card

Add Member Delete Member

Source from Net Caves by courtesy

# WINMED PROFESSIONAL

Thu 28 September, 2006 4:40:04 PM

winMed® Professional Clinic Automation System

Appointment Reception Consultation Dispensary Patient Report Settings Language Monitor Security my winMed

[F1] Add Drug [F2] Delete [F3] Hold Case [F4] Drug Info [F5] Patient Info [F6] Letters [F7] Add Payment [F9] Print [F10] Save Default [F11] Load Default [F12] End Case

100005 Chi Name: 劉秋南 Eng Name: LAU CHAU NAM Gender: MALE Age: 41.8

AP/Inn: BP/Inn/Hgt: Temp(C): RPR/min: Bw(Kg): Height(cm):

S.O.A.P.

Drug Allergies

Chronic Diseases

Patient Notes

Drug Tracking

Default Drugs

Letter Record

Allergy Warning!

Prescriptions

S.O.A.P.

Payments

[ALT-F1] Add Package

Date: 28 Sep 2006 4:32 pm ConsID: 0000033 DR. T. M. CHAN

[Subjective / Symptoms]

Patient complains of a 3 day history of sore throat, cough and fever. Fever is relieved with Tylenol. Patient eating and drinking well. Patient is active and not lethargic.

[Objective / Observations]

General: patient in NAD HCENT. TM's intact and clear O/P: moist and erythematous with exudates Neck: supple with anterior cervical lymphadenopathy Chest: CTA, no wheezes CV: RRR, no murmurs Abd: soft, benign, non-tender Ext: No swelling Rapid Strep: Neg

[Assessment / Diagnosis]

Acute Pharyngitis

[Plan / Management]

OTC decongestant and cough suppressant

Charge Item Code	English Description	Chinese Description	Cost	Amount
CSCommon	Consultation - Common	診症	20.00	100.00
MDCommon	Medication - Common	藥物	0.00	0.00

Date: 22 Aug 2006 4:05 pm ConsID: 0000004 DR. T. M. CHAN

[Subjective / Symptoms]

presents with a long history of a rash on his face.

[Objective / Observations]

O/P moist and pink

ID	Drug Generic Name	Days	T/D	Q/T	Instru	Advn	Total Qty	Unit	Cost	Amount	Calc	Print	
1	ACYCLOVIR 200MG	3	5	4		ANTI	60.0	TAB	3982.76	13320.00			
2	ALDACTONE 25MG	7	2	1		DIUR	14.0	TAB	560.00	3108.00			
3	CO-APROVEL 300MG	7	1	1		BP	7.0	TAB	700.00	1554.00			
4	CO-APROVEL HCT 150MG	3	1	1		BP	3.0	TAB	300.00	666.00			
5	ABC	1	2	10L			20.0	AMPULE	912.10	4440.00			
	ACTIFED						2	10.0	TAB	80.24	2220.00		
	ACTIFED SYRUP						1	5.0	ML	500.00	1110.00		
	ACYCLOVIR 200MG						1	5.0	TAB	331.90	1110.00		

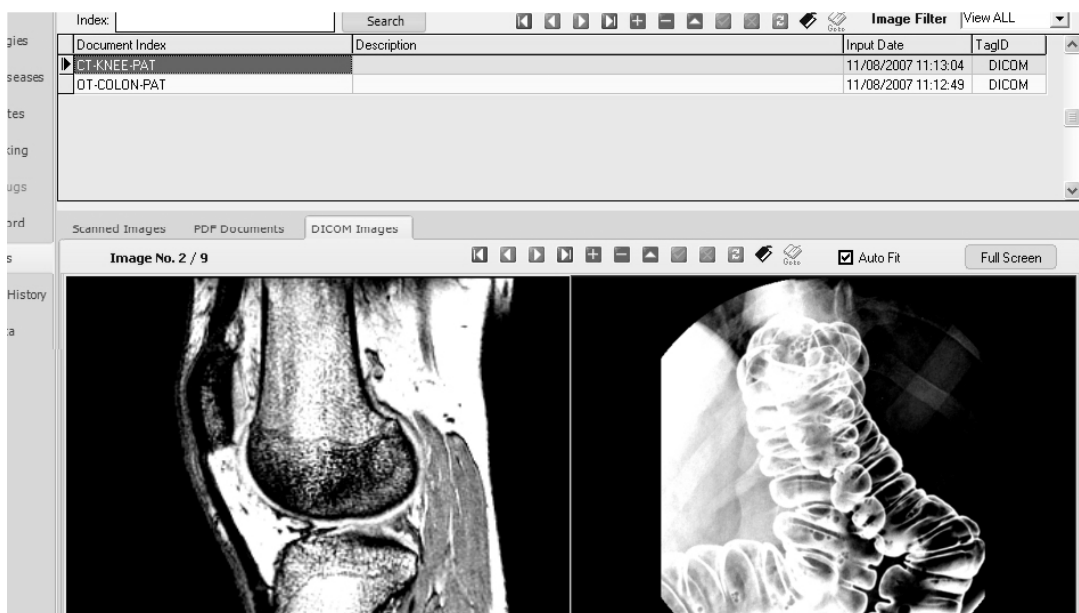
Total Drugs: 5 6454.90 23088.00

Source from Net Caves by courtesy  
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## ATTACHMENT (PHOTOS)



## ATTACHMENT (RADIOGRAPH FILMS)



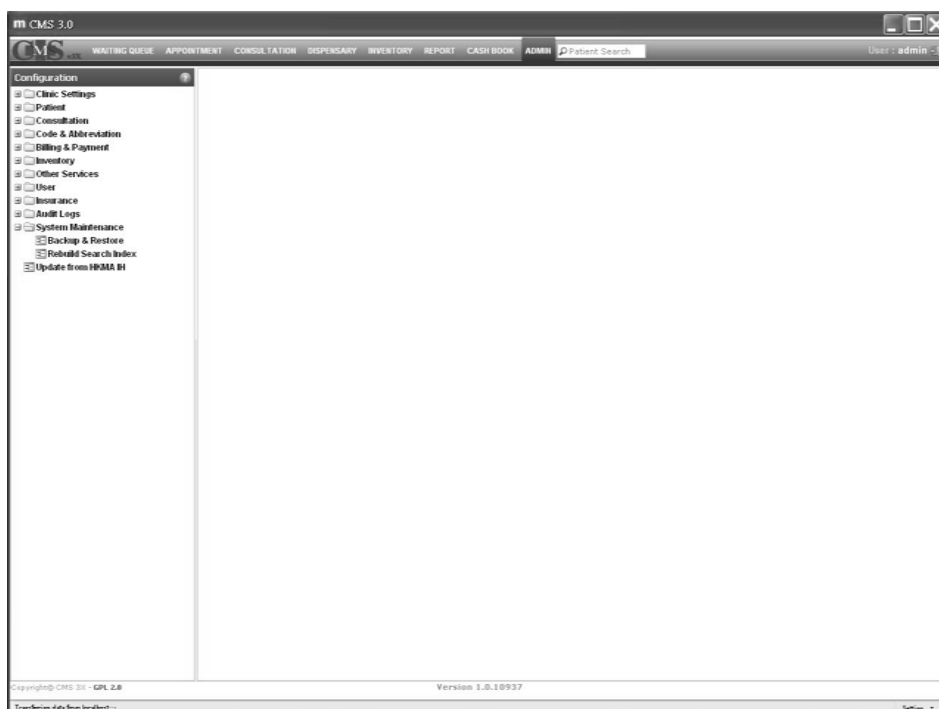
## DATABASE CAPABILITIES

- Popular
  - Microsoft access and SQL server, mySQL
- Capacity Limit
  - MS Access 2Gb, SQL and mySQL -nil
- Security level
- Can be migrated with ease
  - largely depends on created fields eg. Address
- Is CAL (Client access license) required?

## BACKUP

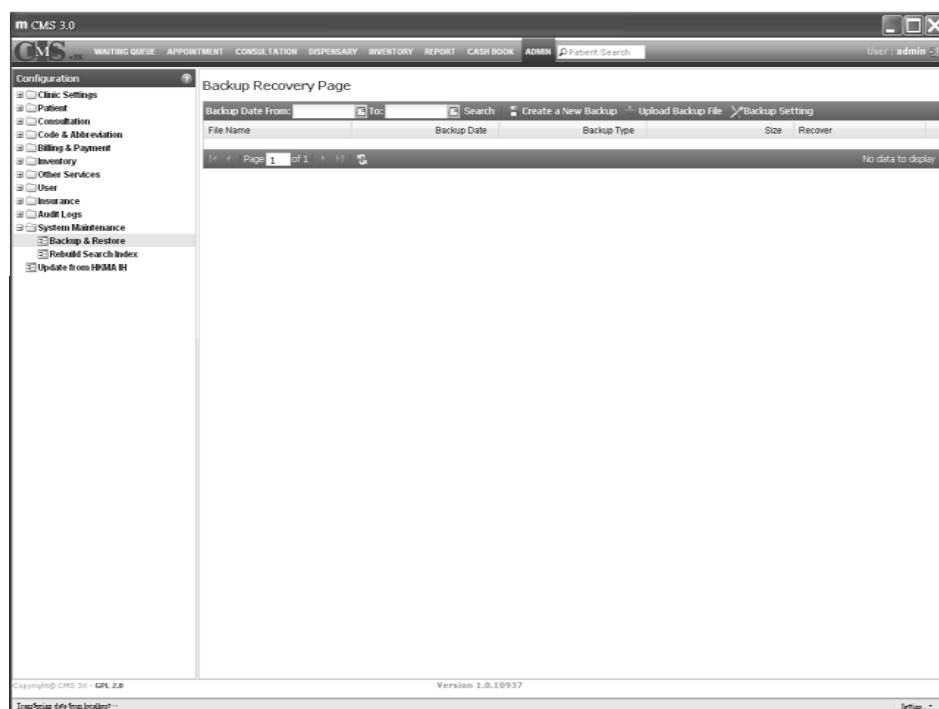
- Speed
- User-friendly
- Efficient
- Reliable
- automatic

# HKMA CMS 3X

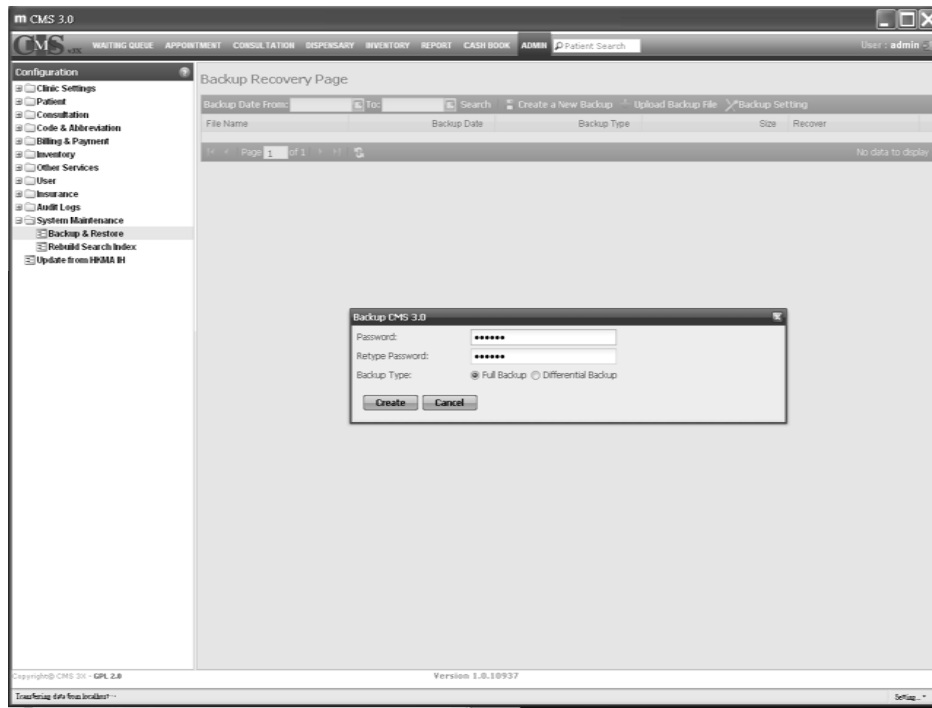


Source from HKMA by courtesy

# HKMA CMS 3X

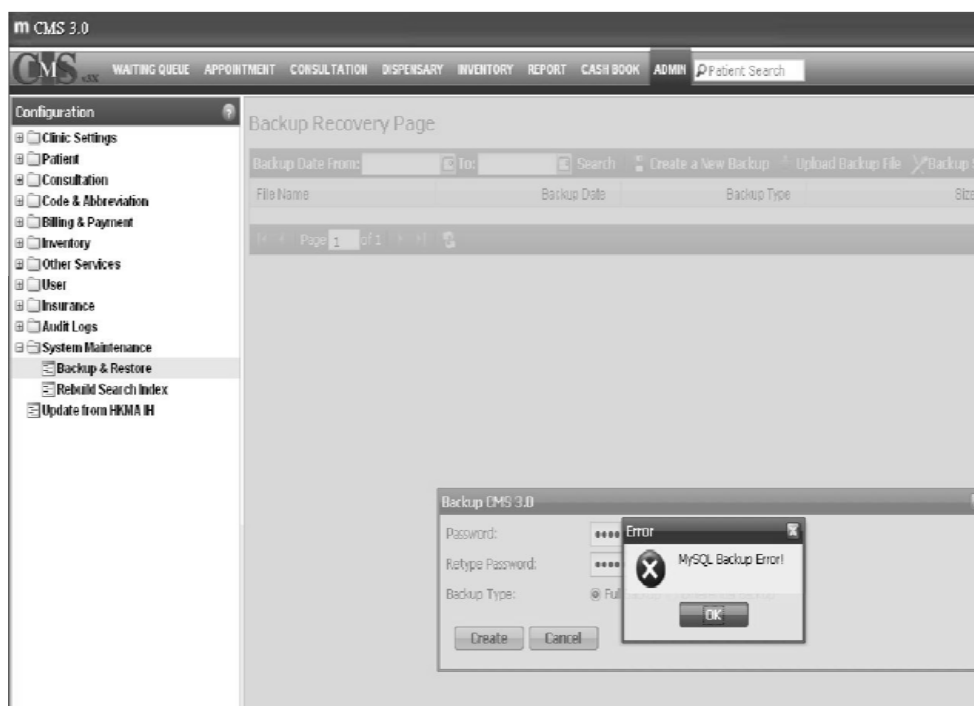


# HKMA CMS 3X



Source from HKMA by courtesy

# HKMA CMS 3X

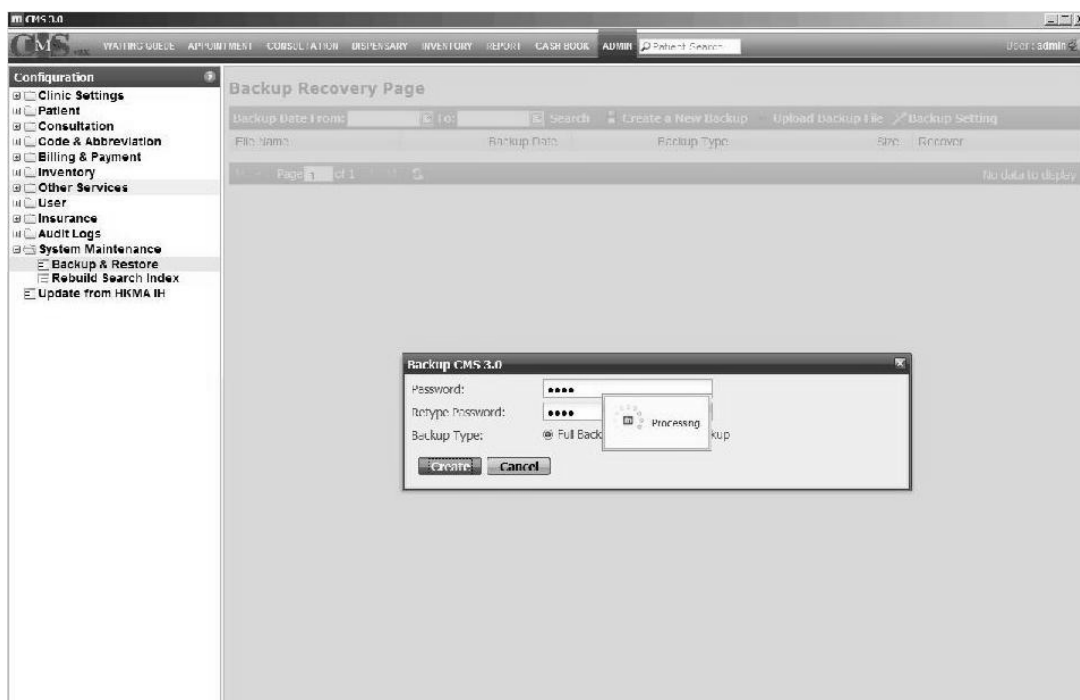




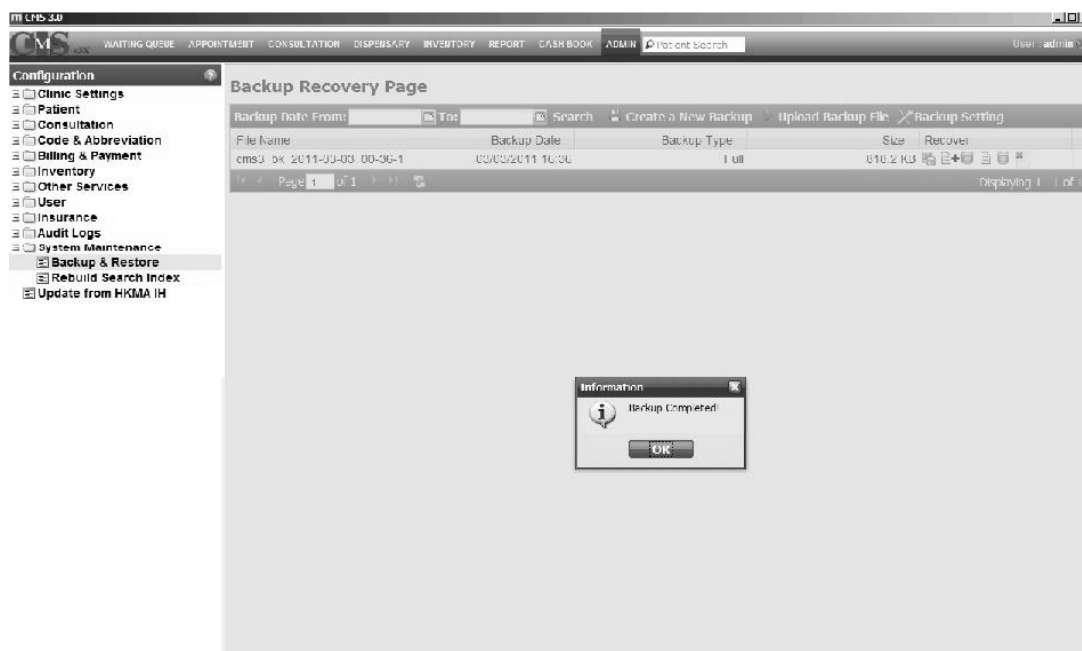
- Before you choose your CMS, make sure you have a system to remember DATABASE

## ***PASSWORD***

## HKMA CMS 3X



# HKMA CMS 3X



Source from HKMA by courtesy

## STANDARDIZED DATA FORMAT

- To facilitate information exchanges between CMS and external medical organizations eg. HA, DH, private hospitals

## STANDARDIZED DATA FORMAT

- ICD = International Statistical Classification of Diseases and Related Health Problems
- ICPC = International Classification of Primary Care
- SNOMED-CT = Systematized Nomenclature of Medicine - Clinical Terms
- HL7 = (Health Level Seven) is a not-for-profit, ANSI-accredited standards developing organization dedicated to providing a comprehensive framework and related standards for the exchange, integration, sharing, and retrieval of electronic health information

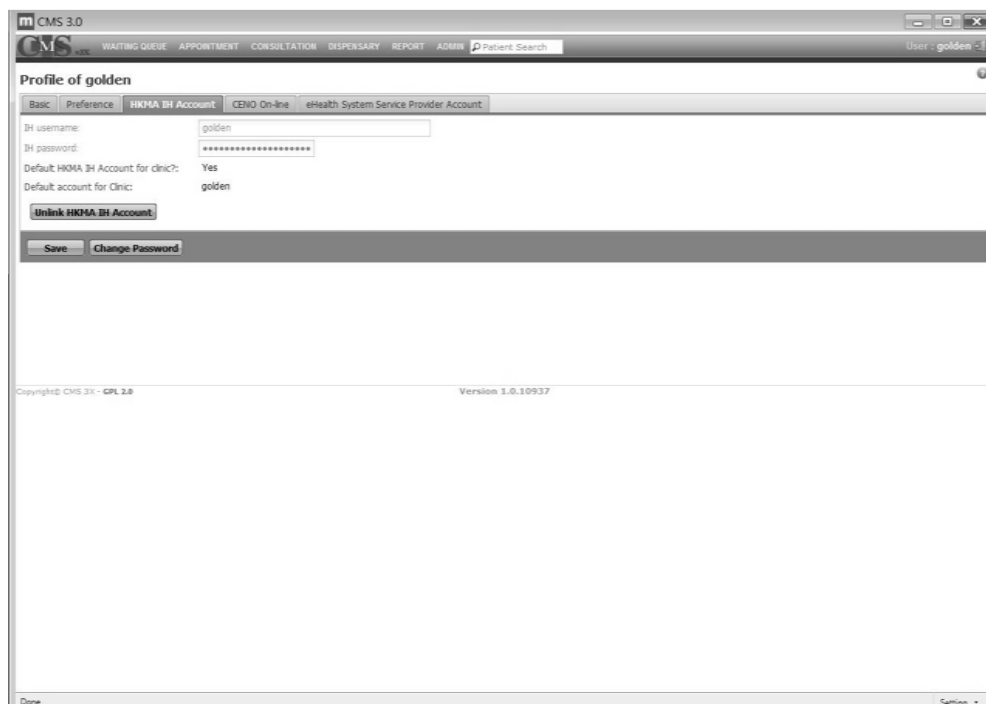
## LINKS WITH EXTERNAL

- Hospital Authority
  - ePR, PPI
- Department of Health
  - CENO
  - eHealth System- eVoucher, vaccination
- Validation Platform

# HKMA CMS 3X-INTEGRATION HUB

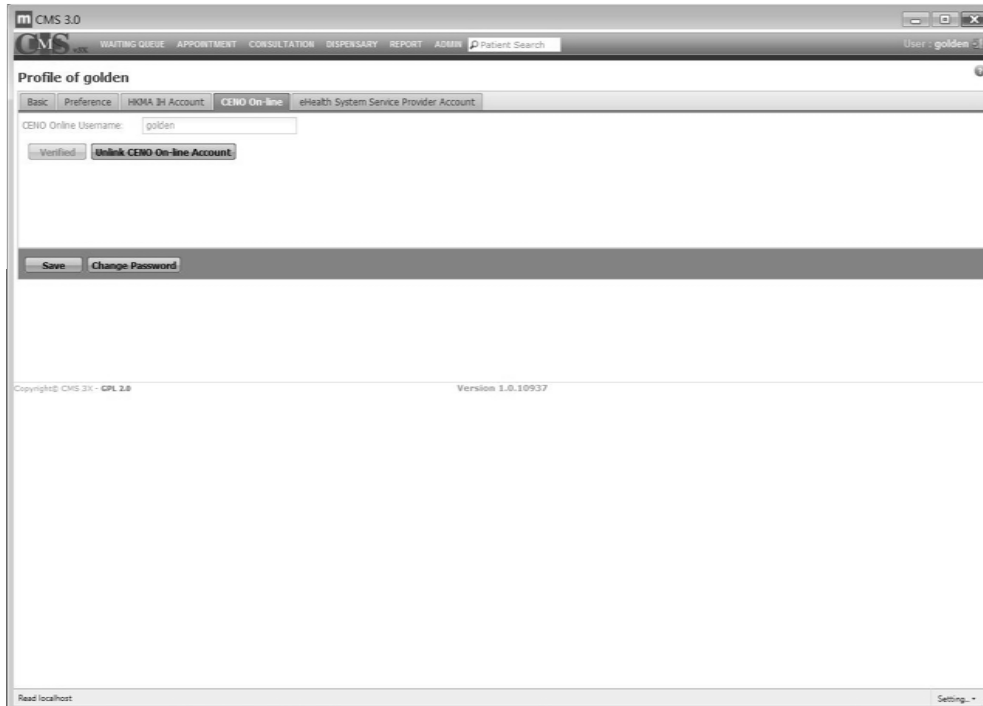
- Innovative
- Connect people
- Links to external world
  - HA, DH, private hospitals, laboratories, physiotherapist, pharmacists etc
  - disease notification (CENO)
  - ePR (electronic patient record)
  - eHealth System (eVoucher, vaccination)
  - validation platform
- ***revolutionize medical world!!!***

## LINKS WITH EXTERNAL WORLD



Copyright© CMS 3X - GPL 2.0 Version 1.0.10937

# LINKS WITH EXTERNAL WORLD



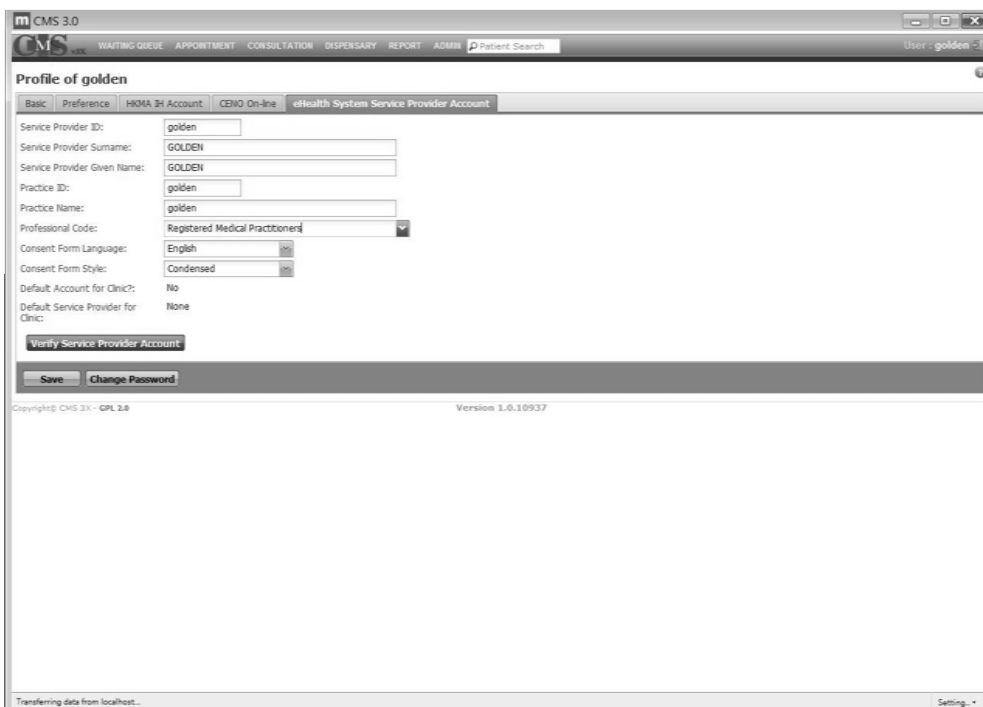
The screenshot shows the 'Profile of golden' page in the CMS 3.0 interface. The page has a navigation bar with tabs: Basic, Preference, HKMA 3d Account, CENO On-line, and eHealth System Service Provider Account. The 'CENO On-line' tab is selected. Below the tabs, there is a form with the following fields and buttons:

- CENO Online Username: golden
- Buttons: Verified, Unlink CENO On-line Account
- Buttons: Save, Change Password

At the bottom of the page, it says 'Copyright© CMS 3X - GPL 2.0' and 'Version 1.0.10937'.

Source from HKMA by courtesy

# LINKS WITH EXTERNAL WORLD

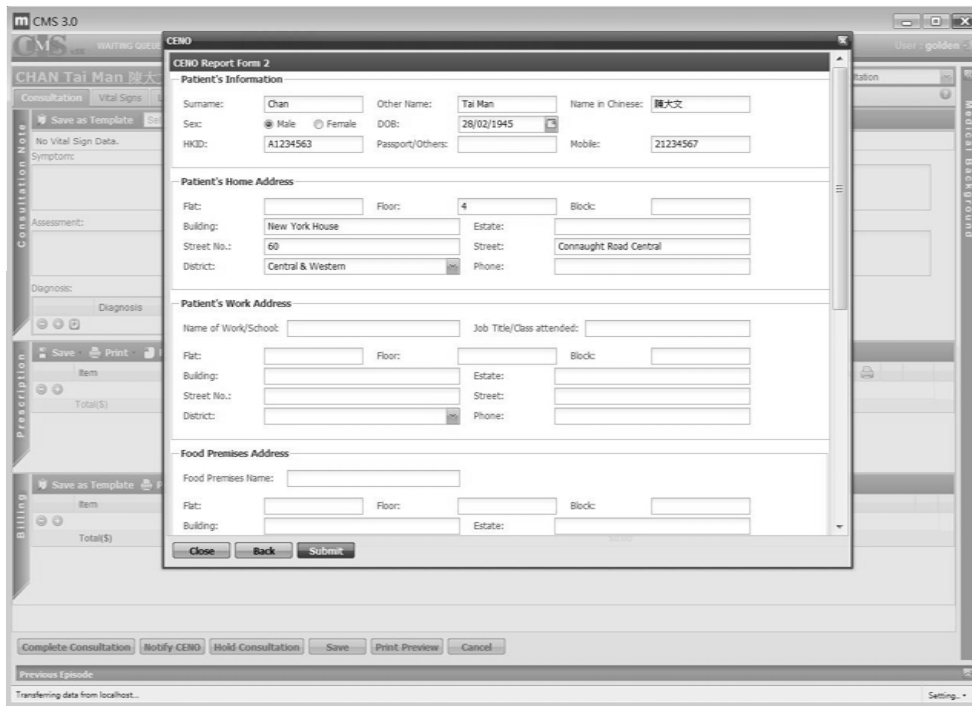


The screenshot shows the 'Profile of golden' page in the CMS 3.0 interface. The page has a navigation bar with tabs: Basic, Preference, HKMA 3d Account, CENO On-line, and eHealth System Service Provider Account. The 'eHealth System Service Provider Account' tab is selected. Below the tabs, there is a form with the following fields and buttons:

- Service Provider ID: golden
- Service Provider Surname: GOLDEN
- Service Provider Given Name: GOLDEN
- Practice ID: golden
- Practice Name: golden
- Professional Code: Registered Medical Practitioner
- Consent Form Language: English
- Consent Form Style: Condensed
- Default Account for Clinic?: No
- Default Service Provider for Clinic: None
- Buttons: Verify Service Provider Account
- Buttons: Save, Change Password

At the bottom of the page, it says 'Copyright© CMS 3X - GPL 2.0' and 'Version 1.0.10937'.

# LINKS WITH EXTERNAL WORLD



Source from HKMA by courtesy

## FUTURE

- We are in an ever changing world
- We are in a world of connecting people
- CMS needs to meet this changing world
  - LINKS to external world
  - Upgrade
  - Modify
  - Extend
  - Expand

## ACKNOWLEDGEMENT

- Hong Kong Medical Association
- Hong Kong Doctors Union
- Mobigator Technology Group
- LX1 Technology Ltd
- Net Caves
- Softlink Medical Solution Ltd

## TAKE HOME MESSAGE

- ***Think of everything I told you before choosing CMS***

THE END

*THANK YOU!*