



# PHARMACY MANAGEMENT INFORMATION SYSTEMS

ITEC107 – Introduction to  
Computing for Pharmacy

# Objectives

- Importance of PMIS
- What is PMIS
- Functions of PMIS
- The Information System Pyramid
- Vendors and top products of PMIS

# Introduction

- Information and Communication Technology plays a great role in different fields and areas. Health case system is one area which is also affected.
- It is necessary to ensure a technologically appropriate, efficient, affordable, environmentally adaptable and consumer friendly system to benefit the health care industry.
- For this reason, Pharmacy Management Information System (PMIS) is being built.

# Introduction

PMIS basically deals with the maintenance of drugs and consumables in the pharmacy unit.

The system will ensure availability of sufficient quantity of drugs and consumable materials for the patient.

This will enhance the efficiency of clinical work, ease the patients convenience and process drug prescriptions effectively.

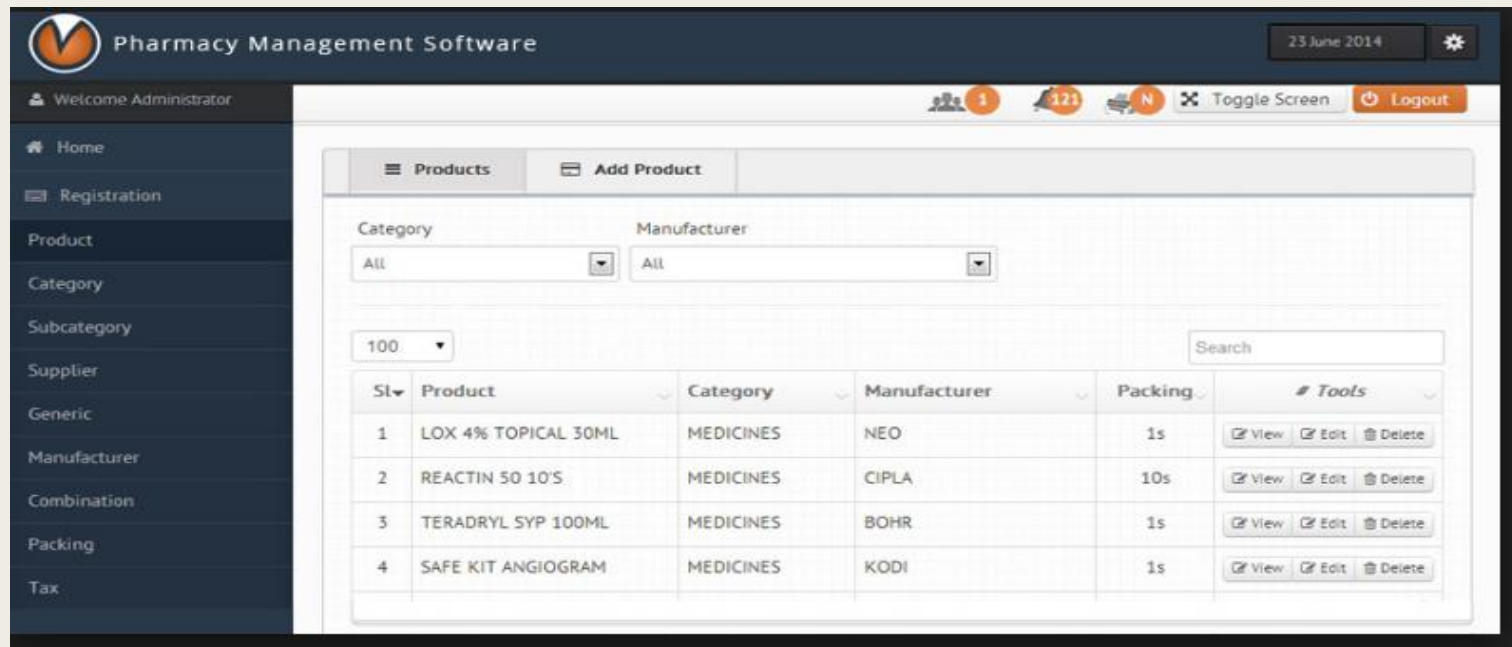
The system will help removing time wasting, saving resources, allow easy access to medicine, as well as bring on more security on the data compared to manual based system.

# Importance of PMIS

- A good PMIS provides the necessary information to make sound decisions in the pharmaceutical sector.
- Effective pharmaceutical management requires policy makers, program managers and health care providers to monitor information related to patient adherence, drug resistance, availability of medicines and laboratory supplies, patient safety, product registration, product quality, financing and program management etc.

# What is PMIS?

- The PMIS integrates pharmaceutical data collection and the processing and presentation of information that helps staff at all levels of a country's health system make evidence-based decisions to manage pharmaceutical services.



The screenshot displays the Pharmacy Management Software (PMIS) interface. The top navigation bar includes the logo, the text "Pharmacy Management Software", the date "23 June 2014", and a settings icon. Below this, a secondary bar shows "Welcome Administrator" and several notification icons (1, 121, N) along with "Toggle Screen" and "Logout" buttons.

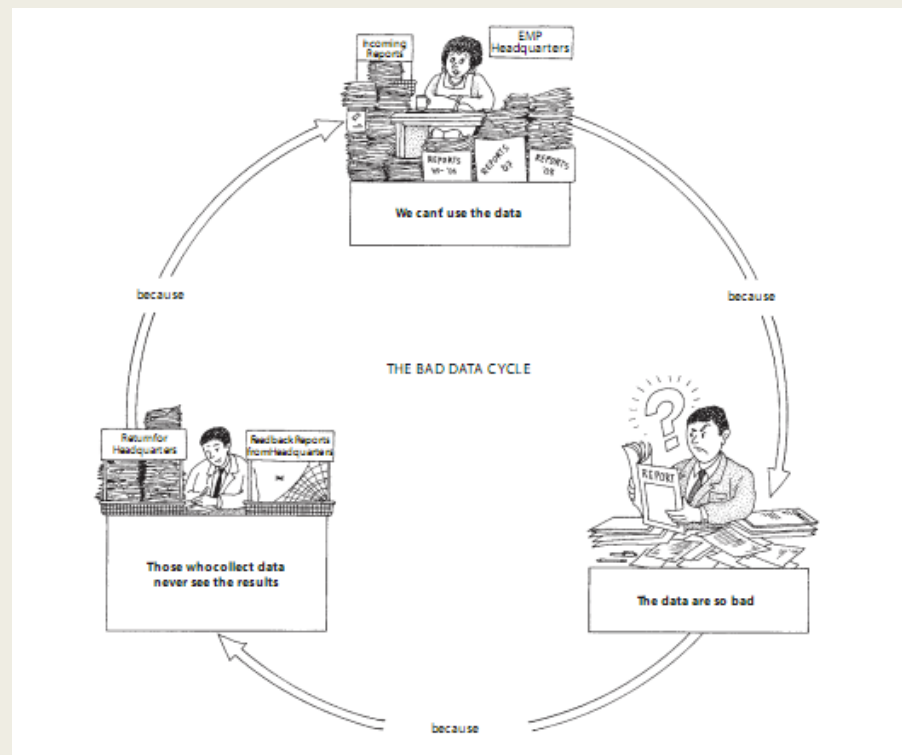
The main content area is titled "Products" and "Add Product". It features two dropdown menus for "Category" (set to "All") and "Manufacturer" (set to "All"). Below these is a "100" dropdown and a "Search" input field.

The central part of the interface is a table listing products with columns for "Sl", "Product", "Category", "Manufacturer", "Packing", and "# Tools".

Sl	Product	Category	Manufacturer	Packing	# Tools
1	LOX 4% TOPICAL 30ML	MEDICINES	NEO	1s	View Edit Delete
2	REACTIN 50 10'S	MEDICINES	CIPLA	10s	View Edit Delete
3	TERADRYL SYP 100ML	MEDICINES	BOHR	1s	View Edit Delete
4	SAFE KIT ANGIOGRAM	MEDICINES	KODI	1s	View Edit Delete

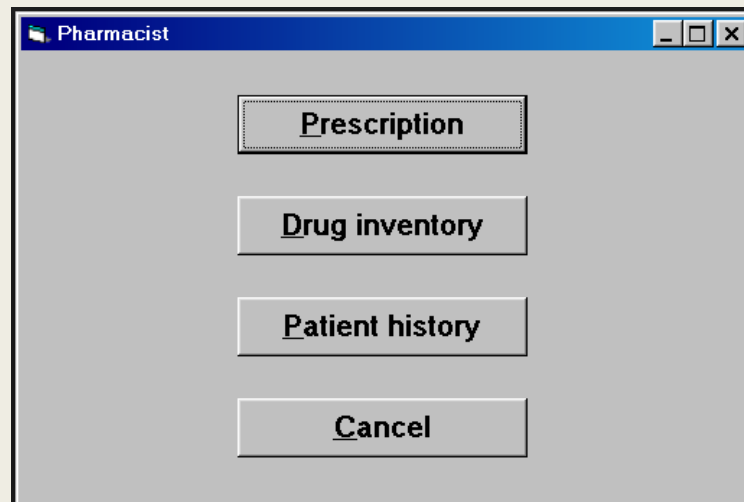
The left sidebar contains a navigation menu with the following items: Home, Registration, Product, Category, Subcategory, Supplier, Generic, Manufacturer, Combination, Packing, and Tax.

# Without PMIS: The bad data cycle



# Other Synonyms

- Pharmacy Management Information Systems are also known as;
  - *Pharmacy Management Software*
  - *Pharmacy System Software*
  - *Pharmaceutical Management Software*





# Functions of PMIS

- An effective PMIS is able to **synthesize the large volume of data** generated by pharmaceutical management operations.
- It then processes the data into information for use in;
  - *planning activities*
  - *estimating demand*
  - *allocating resources*
  - *monitoring and evaluating pharmaceutical management operations*

Every stakeholder in the system should be able to access and monitor their own unit.

# Functions of PMIS

- Another important function is to **improve accountability**. Much of the recording and reporting in a PMIS is intended to create an audit trail for products as they enter or leave a pharmaceutical supply system.



# Data vs. Information in PMIS

- For example, data from health center reveals that 3000 co-trimoxazole tablets were distributed last month. Is this consumption level abnormal?
- Without analysis, this question would be difficult to answer.
- The **data** must be converted to **information** by comparing the 3000 tables distributed last month with the number distributed the previous month, say 1000.
- The management is able to analyze the complete context and make decisions.

# More Functions...

- Some of the activities which PMIS have been employed:
  - *Clinical Screening: The Pharmacy Information System can assist in patient care by the monitoring of drug interactions, drug allergies and other possible medication-related complications.*
  - *Any issues relating to the appropriate dosage and the patient's age, weight and other physiologic factors are tracked. Alerts and flags come up when the system picks up any of these.*

# More Functions...

- Prescription Management: The PMIS can also be use to manage prescription for inpatients and/or outpatients.
- When prescription orders are received, the orders are matched to available pharmaceutical products and then dispensed accordingly depending on whether the patient is an inpatient or outpatient.
- It is possible to track all prescriptions passed through the system from who prescribed the drug, when it was prescribed to when it was dispensed.
- It is also possible to print out prescription labels and instructions on how medication should be taken based on the prescription.

# Prescription Management

Pharmacy Plus, Version 1.0.558 (XP Medical Equipment Pharmacy - Location: Miami, Terminal: ORLANDO-LAPTOP)

File Prescriptions Reports Tools Archive Pickup Window Help

RX Patient Physician Item Plan Quote Sign On Search Report Inventory Cycle Fill Orders CK Drug Delivery Payment Recycle To Do Queue

**Rx Order Entry**

New Prescription  Refill

Patient: HAIRSTON,ROBERT  
 Prescriber: GARCIA,LAZARO MIGUEL  
 Item: ACCUTANE 10MG CAPSULE\*/4015549  
 Quantity Written: 30, Quantity Dispense: 30, Refills: 2, Written: 12/29/2007  
 Sig: QD, Days: 30.0, DAW: 0 - No Product Selection I  
 Instruction: TAKE ONE A DAY.  
 Plan: PCS - CAREMARK SUPER CARF, Origin: 1-Written

Entered by ABA  
 Promise By:  
 Type: Pickup  
 Date: 12/29/2007  
 Time: 2:54:27 PM

Buttons: Show larger picture, Remove this picture, Scan a prescription

Orders

Name	Plan	Item	Refills	Quantity	QtyD

Scan prescription

Buttons: Save, Clear, Close

**Rx Orders**

Pending  Filled  On Hold

Order Entry	ePrescribe	IVR	
Patient	Description	Status	Q
<input type="checkbox"/> ABASCAL, T...	PAXIL 20MG T...	Pending	3
<input type="checkbox"/> ABASCAL, A...	A & D BARRIE...	Pending	3

Sort by Date Entered

Buttons: Fill Orders, From 12/22/2007, To 12/29/2007

# Scanning and Storing Prescriptions

Test Doctor, M.D.  
1254 Easy Street  
Miami, FL 33183  
(305) 555-1234

For *Test Patient*

Address *4512 My Street, Miami, FL 33108*

**Rx**

*Paxil 20mg #30*

*Sig: Bid*

Refill 2 Times Dr. *Test Doctor*  
DEA No *1234567890*

100\_20080110155719\_1\_0.jpg  
Type: JPG File  
Size: 519 KB  
Dimensions: 1652 x 1509 pixels



Document Viewer

Print

### Medco Pharmacy New Prescription Fax Form

Please return this completed prescription fax form to help your patient receive their prescription medication from Medco. Please make or attach a completed prescription below and an fax form to: 800-837-0959. If you have any questions, please call us at 1-800-CASH-RX. Thank you!

34101 NEWRx

Note to Prescriber:

Step 1. Please complete required information below.

Member # *12345678*

Member Name (Last, First, Middle Initial) *Nick Sample*

Prescriber Name and Address *921 Getaway Lane Tallahassee, FL 32317*

Step 2. Complete Patient Information:

Please check all that apply:

Age: *B/16/960*

Sex:  Male  Female

Race:  Asian  Hispanic  Black  Other

Medical Conditions:  Heart Attack/Stroke  Heart Failure  Asthma  High BP  Ulcer  Glaucoma

Other: \_\_\_\_\_

Step 3. Prescriber Information:

Prescriber Fax No. *(305) 555-1235*

Prescriber Name *Test Doctor MD*

Step 4. Sign and Fax Back to:

**1 800-837-0959**

Please do not fax with a cover sheet. We do not accept OTC prescriptions via fax. Fax forms will only be accepted if faxed directly from a prescriber's office. Most patients can receive a 90-day supply plus refills up to 1 year where appropriate.

medco

# More Functions...

- Inventory Management: Pharmacies require a continuous inventory culture in order to ensure that drugs do not go out of stock. This is made even more difficult when there are multiple dispensing points. When done manually it is very difficult to maintain an accurate inventory.
- PMIS aid inventory management by maintaining an internal inventory of all pharmaceutical products, providing alerts when the quantity of an item is below a set quantity and providing an electronic ordering system that recommends the ordering of the affected item and with the appropriate quantity from approved suppliers.



# Inventory Management

The screenshot shows a web browser window displaying an inventory management interface. The main content is a table of items, with a search bar above it containing the text 'azithro'. The table lists various Azithromycin products with columns for Item, Code, Generic, Rate, Stocks, and Expiry. Annotations highlight specific features: a search bar containing 'azithro' is circled in orange; a red box highlights the first few rows of the table; yellow callouts provide information about generic names, rates, stocks, and expiry dates. The interface also includes sections for 'Bill Items', 'Bill Totals', and 'Patient Detail'.

**Bill Items**

Medicines/Services

Quantity Rate Value

azithro Add 0.00 0.00

**Bill Totals**

Total 0.00

Discount 0.00

Total 0.00

Entered [input]

Balance 0.00

**Patient Detail**

New Patient Search Patient

Title Select Title

Name [input]

Sex Select Sex

Age YEAR MONTH DAYS

Address [input]

Phone [input]

Date of Birth [input]

20:51 PM - 13 September 2014

Item	Code	Generic	Rate	Stocks	Expiry
Az-1 250mg Capsule	9055	Azithromycin 250.0 mg Cap	20.00	6	01/04/2016
Az-1 250mg Capsule	9055	Azithromycin 250.0 mg Cap	20.00	107	01/04/2016
Azee 250mg Tablets	5241	Azithromycin 250.0 mg Tab	25.00	103	01/04/2016
Azee 250mg Tablets	5241	Azithrom	25.00	18	01/03/2017
Azee 500mg		ithrom	45.00	1	01/07/2015
Azee 500mg		ithrom	45.00	99	01/12/2016
Azee Dry Syrup 15ml	5502	Azithrom	150.00	5	01/03/2016
Azeecor 500mg	8854	Azithromycin 500.0 mg Tab	59.25	10	01/07/2014
Azilide 250mg Tablet	8993	Azithromycin 250.0 mg Tab	40.25	2	01/10/2014
Azilide 500mg Tablet	3598	Azithromycin 500.0 mg Tab	44.47	3	01/10/2014
Azith 250mg Tablet	8302	Azithromycin 250.0 mg Tab	20.00	100	01/07/2015
Azithromycin 500mg Tablet	6285	Azithromycin 500.0 mg Tab	36.00	2	01/07/2015
Azithromycin 500mg Tablet	6285	Azithromycin 500.0 mg Tab	36.00	43	01/07/2015
Azivid 15ml Syrup	7797	Azithromycin 200.0 mg/5ml Suspension	130.00	1	01/05/2013
Rosith suspension	1404	Azithromycin 200.0 mg/5ml Suspension	160.00	1	01/03/2015
Zithrin 250mg capsule	6676	Azithromycin 250.0 mg Cap	71.25	36	01/10/2015
Zithrin 35ml Syrup	6653	Azithromycin 200.0 mg/5ml Suspension	344.00	1	02/06/2016
Zithrocin 15ml Syrup	3501	Azithromycin 200.0 mg/5ml Suspension	150.00	2	03/10/2014

Annotations:

- First Few Letters of the Generic Name
- Items that contain Azithromycin are listed
- Rates. Clients can be informed about the cost to make them a decision on financial aspects.
- Available Stocks for the Pharmacist to help in selecting an item.
- Expiry Dates will help the pharmacist to make decisions to select the item

# Inventory Management

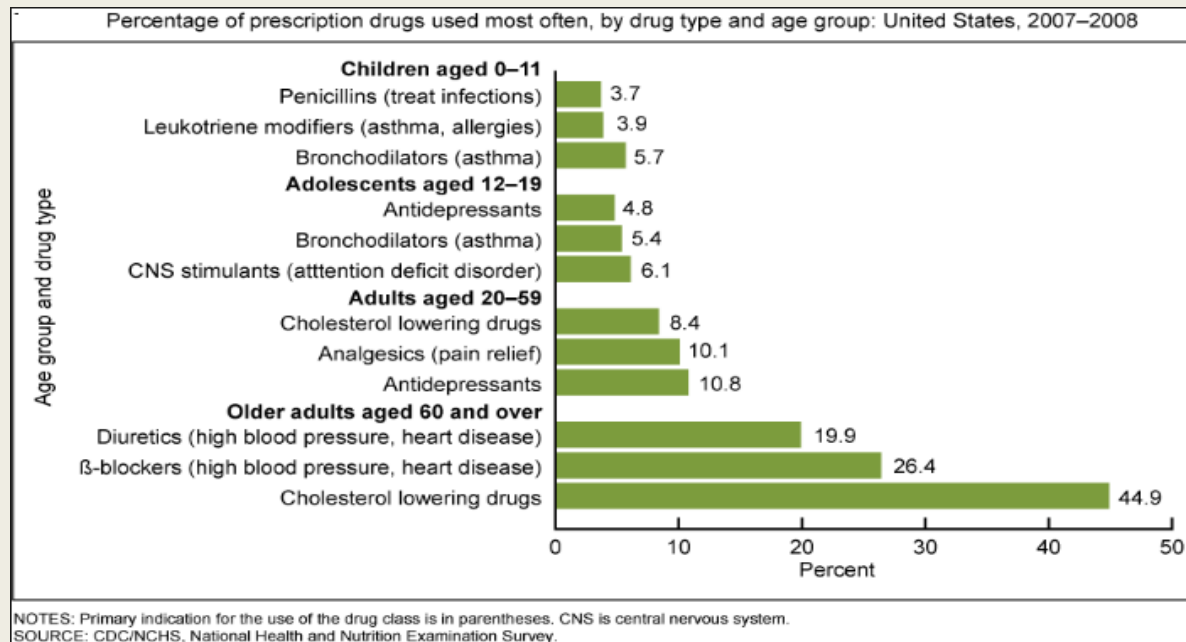
## TAKE A PHYSICAL INVENTORY OR CYCLE COUNTING IN THREE STEPS:

- 1 Scan the item.
- 2 Enter the package (if more than one) or partial quantity.
- 3 Repeat step 1 and 2 until complete.

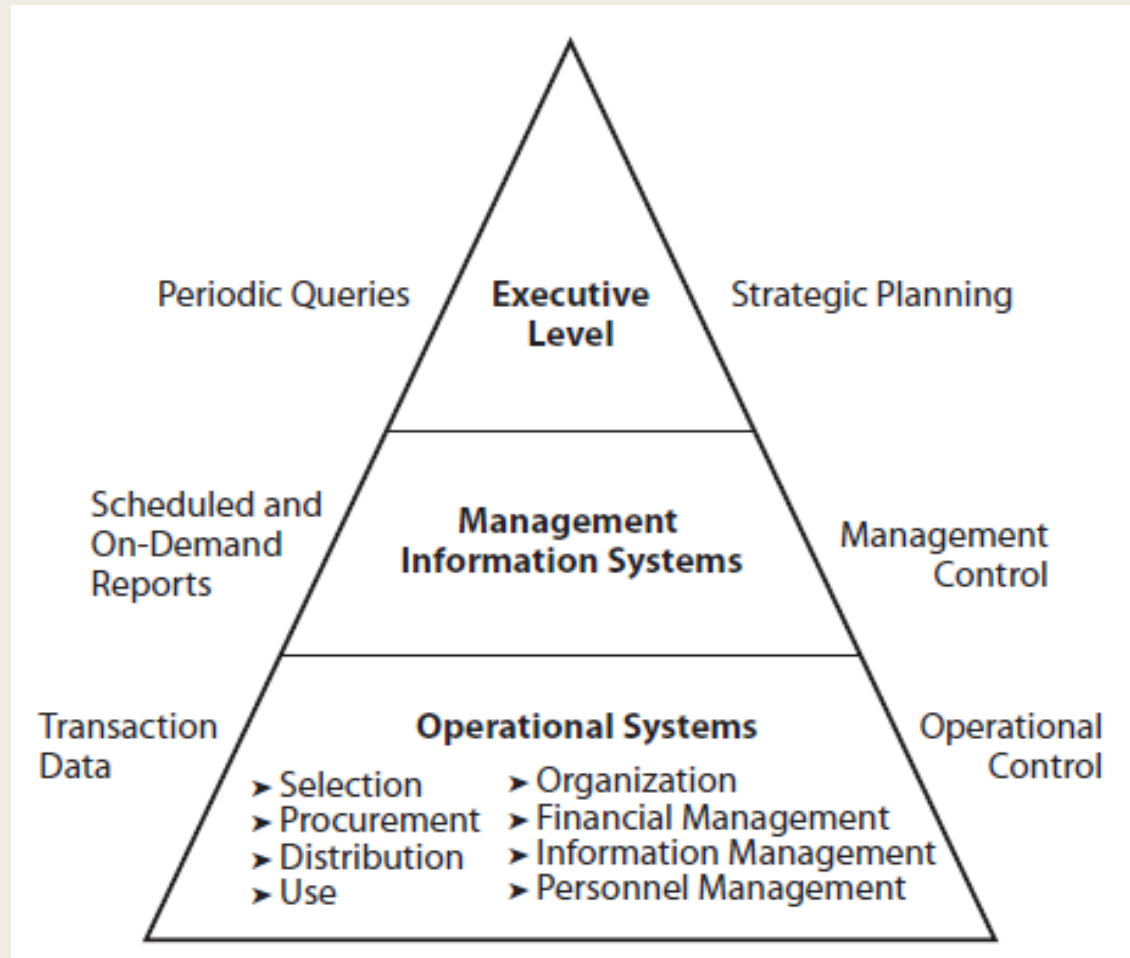


# More Functions...

- Report Generation: Most Pharmacy Information Systems can generate reports which range from determining medication usage patterns in the hospital to the cost of drugs purchased and /or dispensed within the given time period.



# The Information System Pyramid



# The Information System Pyramid

- At the base of the pyramid are operational systems. These include subsystems – procurement, distribution, financial management and medicine use – that handle data at the transactional level.
- Every item that moves in and out of the inventory must be tracked, and decisions must be made about how much to supply to a health facility, when to reorder and how to bill.

# The Information System Pyramid

- The next level of the pyramid is formed by management information system (MIS).
- These systems typically provide summaries of operational data in a periodic basis to help managers of specific departments monitor the performance of their units.

# The Information System Pyramid

- The highest level of the information system pyramid is the executive level.
- At this level, the system further summarizes management information for use in strategic planning and policy making.
- The system generates a program-wide information on how effective the organization is in accompanying its mission.

# Meeting The Information Needs Of Users With Different Requirements

- Staff at every level and position use information to make decisions that affect overall functioning of a pharmaceutical supply system.
- For example, the chief pharmacist may be unaware that large quantities of a medicine are due to expire in the warehouse. But if the pharmacist had information about the expiration dates and could match that information with data on the stock levels in the health facilities, medicine could be dispatched to facilities that are running low, thereby averting waste of money and medicines.



Level and function	Users	Information needs
<b>National</b>		
Selection	National essential medicines committee	Morbidity patterns Standard treatment strategies
Procurement	Procurement unit	Medicine-use rates Lead times Supplier performance Prices Funds available for procurement
Medicine-use education	Training unit	Number of staff trained in essential medicines use Number of public education messages developed and campaigns conducted
Financial management	Finance unit	Operating costs Revenues Value of inventory Stock turnover rates Stock fund growth or loss
<b>Provincial/district</b>		
Warehousing	Medical stores manager	Medicine-use rates Maximum and minimum stock levels Lead times for requisitions from the national level Shelf life Warehouse maintenance and equipment needs
Distribution	Logistics manager	Stock losses Distribution schedules Vehicle-use records Maintenance and fuel costs
<b>Facility</b>		
Use	Medical director, pharmacist	Prescription patterns Patient adherence Pharmaceutical availability Patient load
Inventory control	Storekeeper	Maximum and minimum stock levels Lead times for requisitions Prices Medicine-use rates Shelf life Cold-storage temperature variations

Information users and information needs

# Meeting The Information Needs of Users With Different Requirements

- A good PMIS alerts staff to problems and triggers critical actions at all levels.

The screenshot displays a PMIS interface for a prescription. The window title is "Rx # 10676". The interface is divided into several sections:

- Header:** Includes icons for Exit, Undo, Edit, Refill, History, Tools, and Image, along with a "Store No" field set to 157.
- Patient Information:** Patient name "Smith, Alice", RX No. "10676", Doctor "Lee, Kim", and Date Filled "01/25/2011".
- Drug Information:** Drug name "LOPRESSOR 100MG TAB".
- Quantity and Refills:** Rx Qty. "60", Refills Auth. "2", T. Qty. Auth. "180".
- Dispensing and Payment:** Qty Disp. "60", Sale Code "C", Pat. Pay "\$171.60".
- Instructions:** "take one tablet twice daily".
- Caution:** A red text box circled in red contains the message: "Caution TAKE WITH FOOD. MAY CAUSE DIZZINESS. Report rash or allergic reaction."
- Other Fields:** Days Supply "30", Labels/Rec. "0/0", DAW "0", Rx Origin "Written", Drug Exp. Date "02/08/2012".

On the right side of the interface, there is a scanned image of a prescription form from "STREBY MEDICAL GROUP". The scanned form includes the following information:

- Address: 7844 Garden Grove Blvd, Garden Grove, CA 92708
- Doctors: Dr. Kim Lee (AK1134567) and Dr. Smith, John (AS0921521)
- Phone: (714)555-1212, Fax: (714)555-1315
- Patient Name: Alice Smith, Date: 1/25/11
- Address: 71623 Main St., Phone: 714-555-1436
- Medication: Lopressor 100mg #60
- Signature: Kim Lee, Date: 1/25/11
- Refills: X 2 refills

# Popular PMIS Vendors in the Market

- Cerner Etreby
- Health Business Systems
- Healthcare Computer Corp.
- OPUS-ISM LLC
- Perse/NDC/McKesson
- PDX Inc.
- QS/1
- Rx30

# Top PMIS Software Products

- FSI Pharmacy Management System
- ApotheSoft-Rx
- Medeil
- Rx30 Pharmacy System
- PrescribeWellness
- PharmaCODE
- Speed Script

# Top PMIS Software Products in Turkey

- Farmakom Eczane Bilgisayar Hizmetleri
- Botanik Eczane Otomasyon Sistemi
- Eczanem Eczane Otomasyon Sistemi
- Robotik Eczane Otomasyonu
- RxMediaPharma® Eczane Yönetim Sistemi

# Summary

- The PMIS is an organized system for collecting, processing, reporting and using information for decision making.
- Designing of a PMIS should be based on the different information needs of users at each level of the system and should build on existing forms, reports, and procedures as much as possible.

# Summary

- A successful PMIS requires effective use of the information generated, which includes;
  - *Efficient data processing to reduce large amounts of data to a manageable number of key indicators*
  - *Presentation of information in graphic form to simplify interpretation*
  - *Interpretation of information to identify trends and potential problems*
  - *Appropriate use of technology (for example, email, websites) to present and share information with a wider audience in less time*
  - *Action in response to both positive and negative results*
  - *Effective mechanism to provide and receive feedback*