

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

مدیریت زنجیره تامین دارو در افق ۱۴۰۴

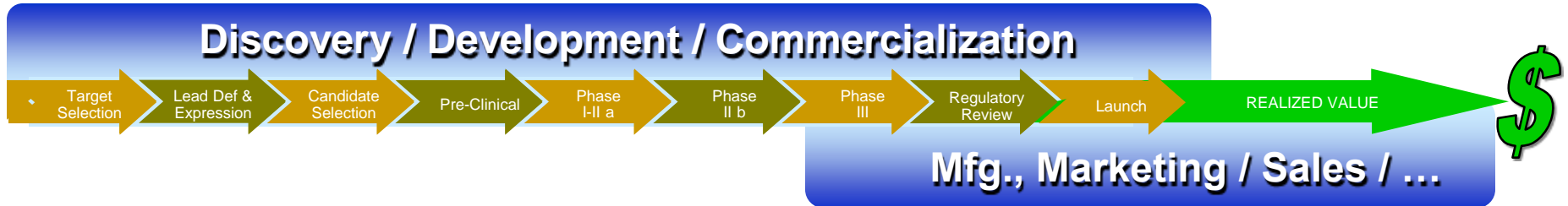
دکتر وحید محلاتی

شهریور ۱۳۹۱

The Pharmaceutical Value Chain

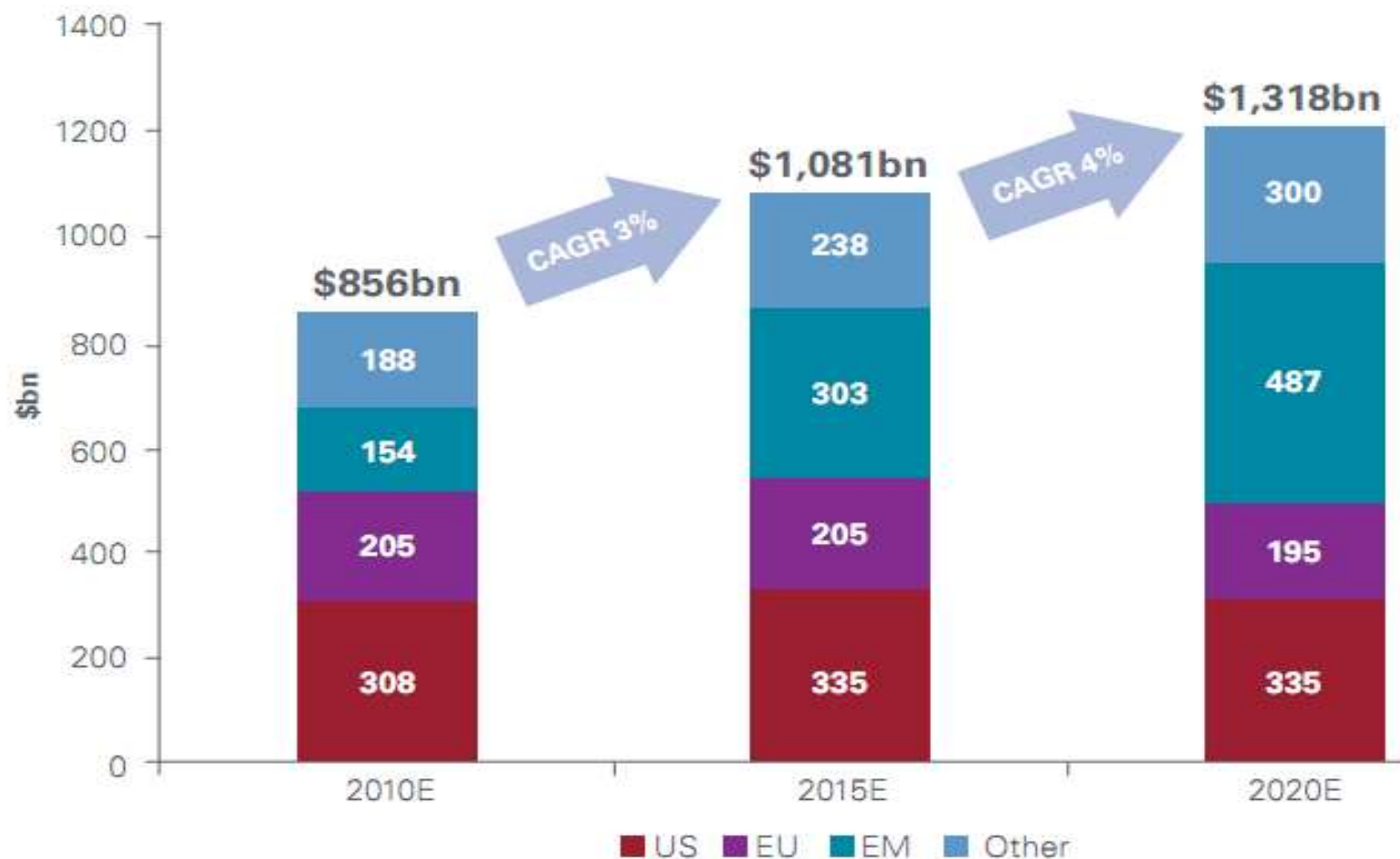
- The pharmaceutical “value chain” is only partially synonymous with the pharmaceutical “supply chain”

Discovery / Development / Commercialization



- The “value chain” describes how the addition of knowledge to a specific molecule through transformational processes of R&D, pre-clinical, clinical trial, manufacture, marketing and sales activities generates commercial value to a pharma/biotech company
- The “supply chain” refers to the activities involved with planning, sourcing, manufacturing and distributing your products as it does for any other company
 - There is also a “clinical supply chain” which addresses sourcing and provision of materials to clinical trial investigators
 - It’s still “Source”, “Make” and “Distribute” with “Plan” at the head of each major supply chain domain

Pharmaceutical Industry 2010 to 2020 by Major Geographic Market



Trends

Market

- Well informed patients
- Increased demand for personalized medicine
- Patients' orientation toward complete remedy of diseases
- Increased demand in emerging markets
- Increased presence of chronic diseases like diabetes

Health and healthcare


- Increased burden due to highly demanding regulations
- Increased costs related to healthcare
- Increased complexity in healthcare programs and insurance coverage
- Pharmaceutical companies providing health care and patient assistance plans apart from their core business e.g. Pfizer's "Patient Assistance program aims for broadest access for its prescription drugs.

Technology

- Advent of innovative technical tools, such as LASER in drug development
- Increased number of Contract Research Organizations and Contract Manufacturing Organizations
- Development of virtual R&D centers, which reduces time to market

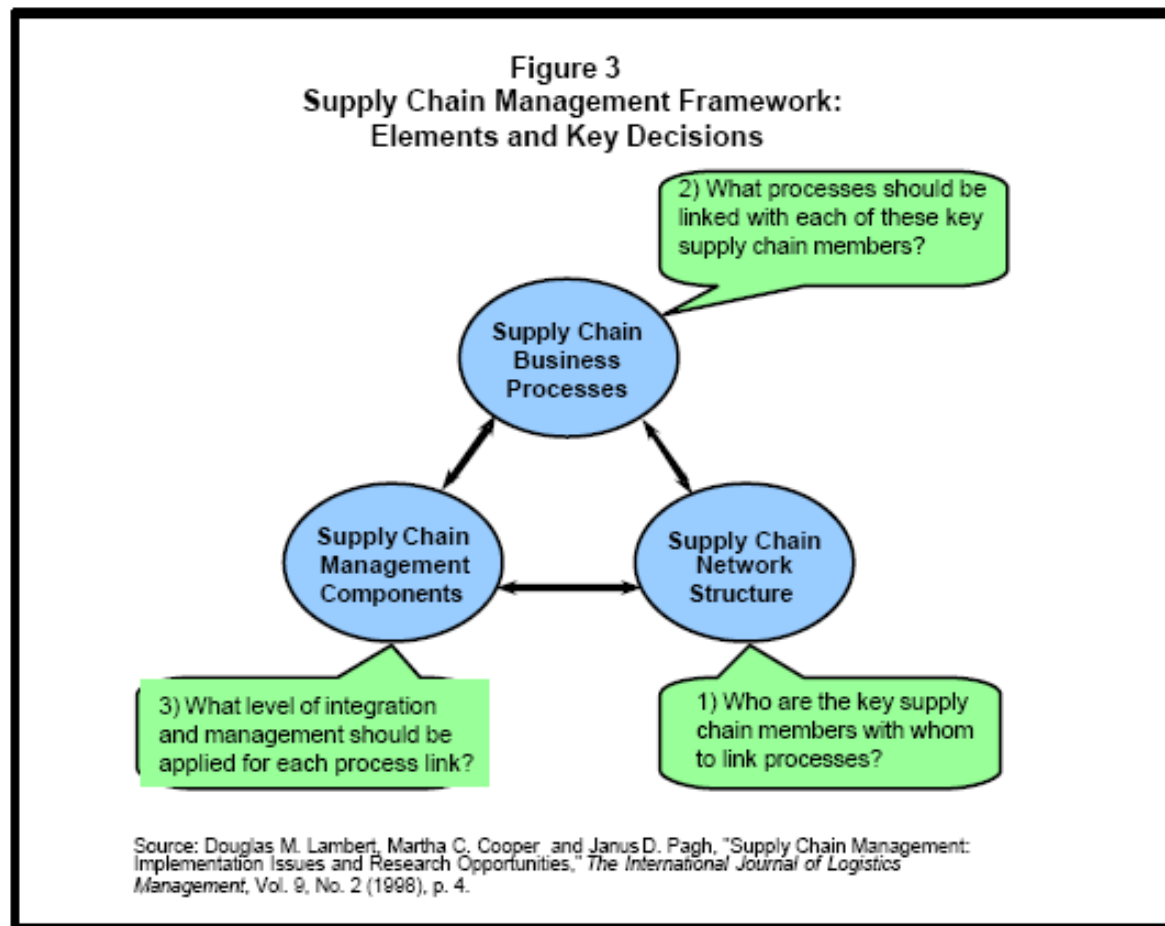
Future Industrial Success Factors

Source: KPMG estimate

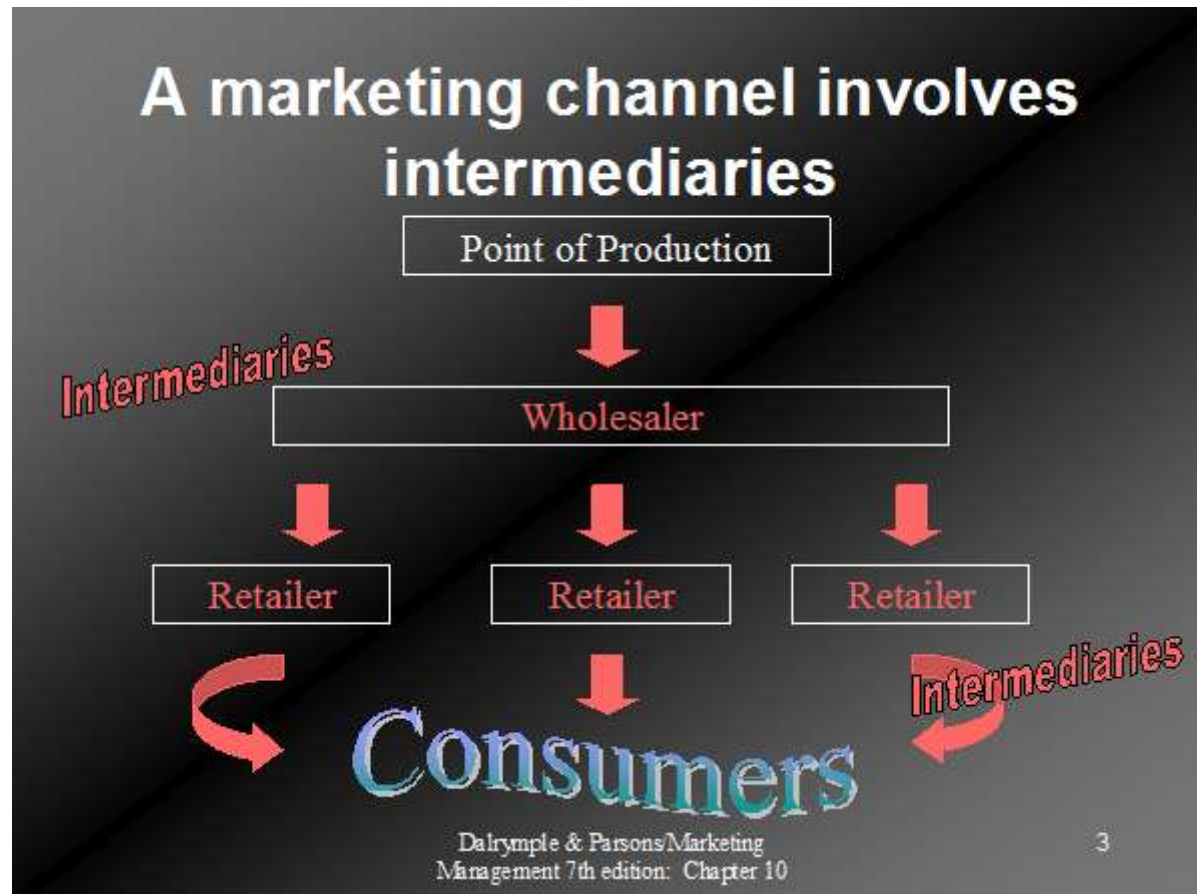
Bases of competitive advantage today		Bases of competitive advantage in 2020
Development resources, sales and marketing scale		Value of products and services, distribution strength
Global high prices, restricting access		Pricing based on ability to pay driving volume uplift
Multiple competitors in major therapeutic areas, scale permitting success		Fewer competitors in a broader range of diseases
Multi-billion dollar drug revenues covering high fixed costs		More products with lower revenues and lower costs
End to end operational capabilities for "self-sufficiency" strategy		Significant outsourcing of operations such as manufacturing and support functions
Acquisitions of technologies and products to augment product pipeline		Greater collaboration with academia, biotech and peers
Focus on mature Western Markets		Focus on Emerging Markets

Supply Chain

- Supply Chain refers to the distribution channel of a product, from its sourcing, to its delivery to the end consumer (also known as the value chain). The supply chain is typically comprised of multiple companies who coordinate activities.



Ch. 10: Distribution



• جمعیت ایران ۱۳۹۱

۷۵ میلیون نفر

تعداد داروخانه ۹۰۰۰

• جمعیت ایران ۱۴۰۴

تعداد داروخانه ۱۴۰۰۰

۱۵۰۰۰

۱۷۰۰۰

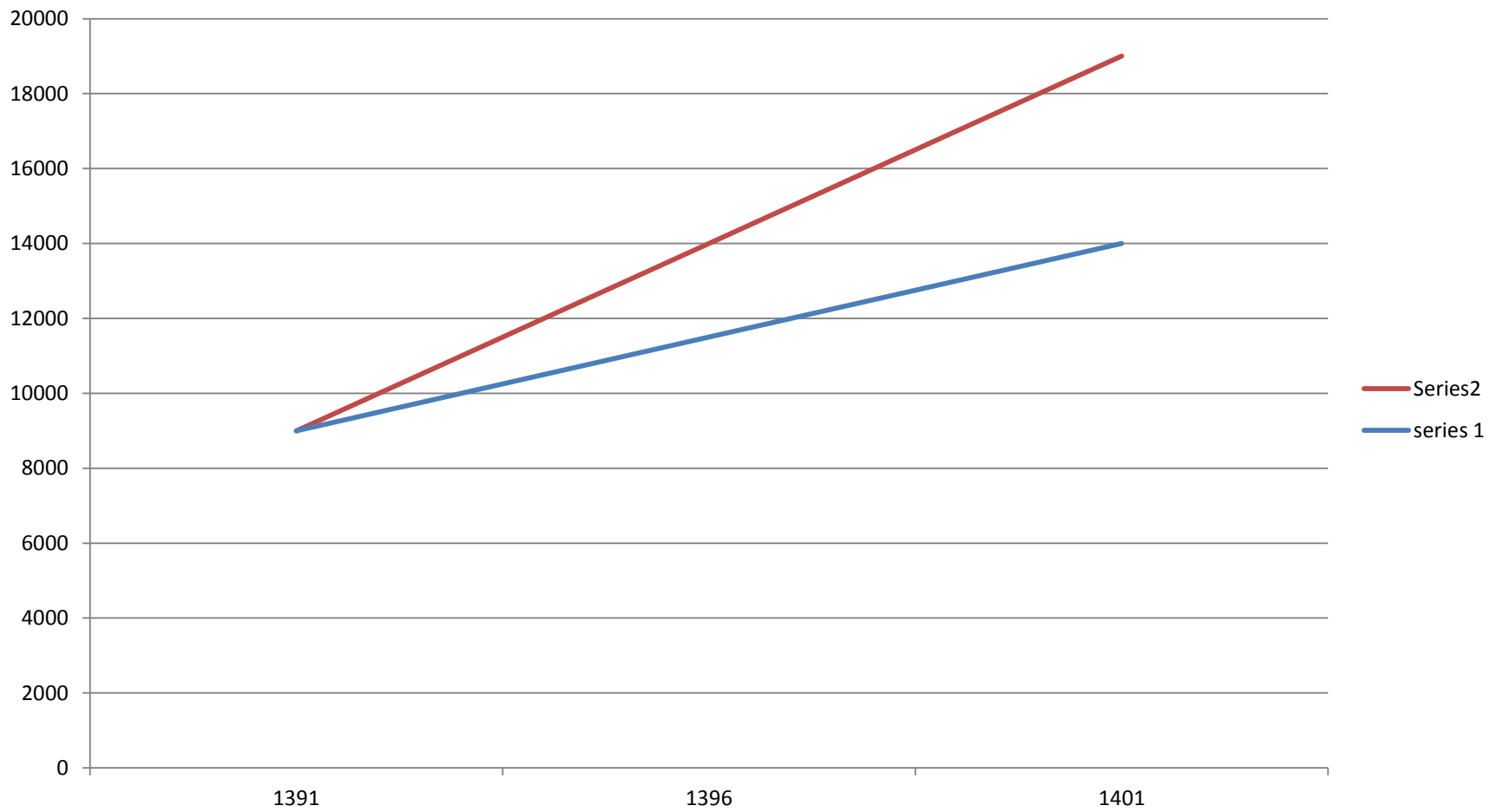
سناریو ۱ ۸۵ میلیون نفر

سناریو ۲ ۹۰ میلیون نفر

سناریو ۳ ۱۰۰ میلیون نفر

- این به معنی افزایش حد اقل ۷۰۰۰ داروخانه طی ۱۳ سال آینده یعنی سالیانه ۵۴۰ داروخانه است .
- فرض اساسی این محاسبه ثابت ماندن سطح خدمات ارائه شده در داروخانه ها و حفظ وضعیت اقتصادی موجود میباشد.
- تعداد داروخانه ها در کشور ترکیه با حدود ۸۰ میلیون نفر حدود ۲۲۰۰۰ داروخانه می باشد .

- برای دستیابی به نرخ یک باب داروخانه برای هر ۵۰۰۰ نفر
تعداد داروخانه ها به اعداد ۱۷۰۰۰ تا ۲۰۰۰۰ خواهد رسید و
این یعنی افتتاح سالیانه ۱۰۰۰ داروخانه و دو برابر شدن تعداد
مشتریان در سال ۱۴۰۴ در لایه خرده فروشی در زنجیره
تامین.



الزامات توزیع در این وضعیت

- افزایش امکانات حمل و نقل
- افزایش فضای انبارش
- افزایش تعداد پرسنل
- استفاده از فن آوری های جدید IT ، TC و ...

Order gathering

Mechanized & robatic

Rfid

- کاهش حجم سفارشات ، افزایش سطح خدمات

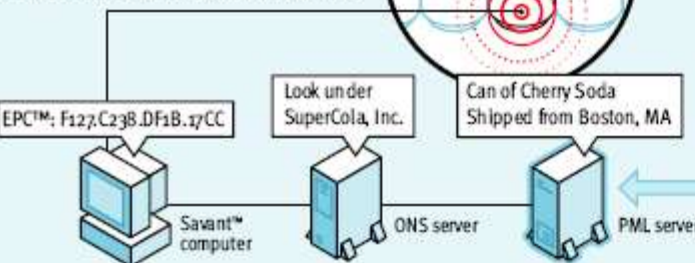
With the new EPC™ Network, computers will be able to “see” physical objects, allowing manufacturers to track and trace items automatically throughout the supply chain. This technology will revolutionize the way we manufacture, sell and buy products. Here’s how it works:

1. Each item contains a tiny microchip which includes a radio antenna and a unique identifier, called an Electronic Product Code (EPC™). This Radio Frequency Identification (RFID) tag costs about five cents to make.

2. The item can now be automatically and cost-effectively identified, counted and tracked. Cases and pallets can also carry their own unique tags.

3. As pallets leave the manufacturer, an RFID reader positioned above the loading dock door beams a radio wave that “wakes up” the tags.

4A. The tags broadcast their individual EPCs™ to the reader, which rapidly switches them on and off in sequence, until all are read.



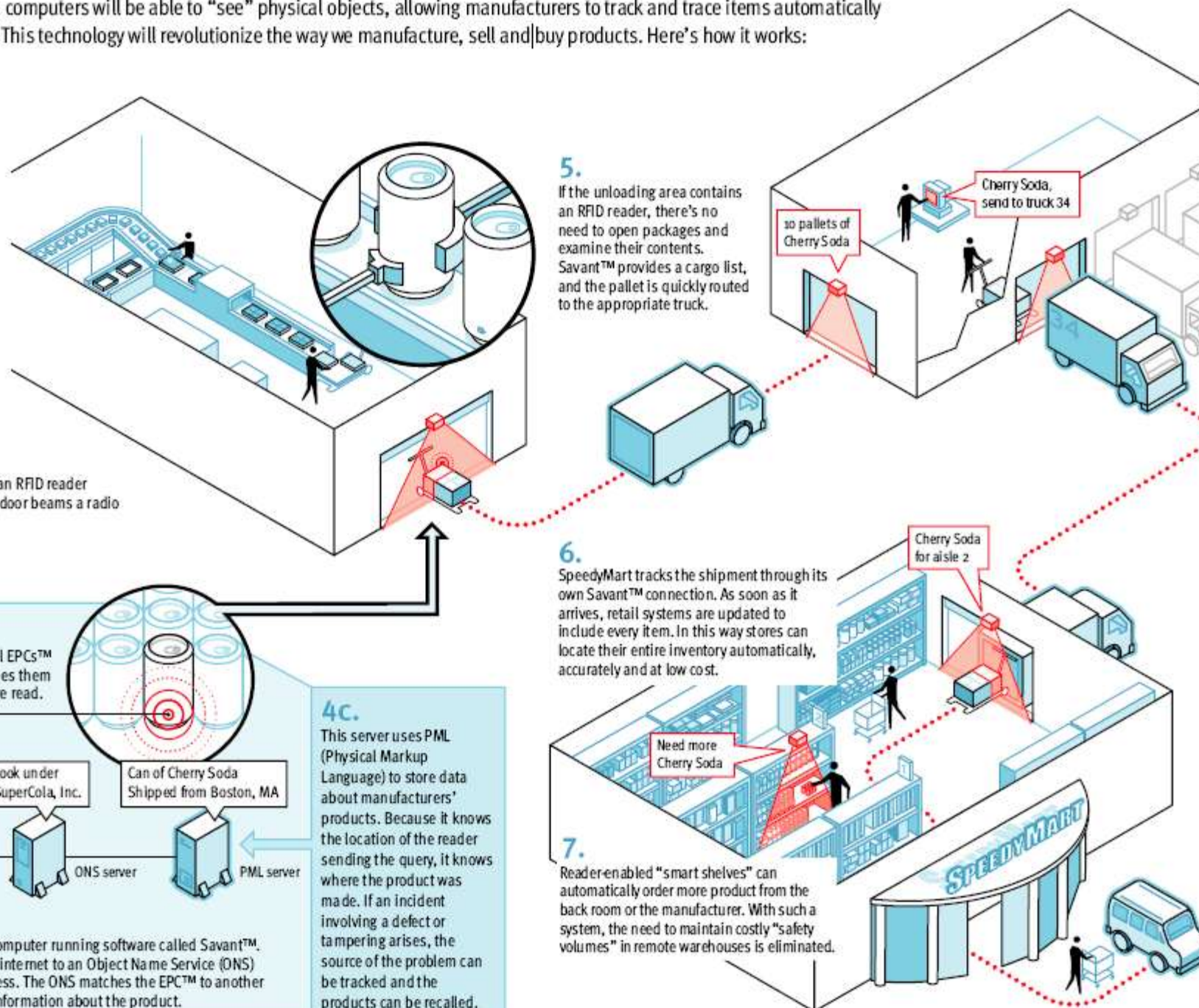
4B. The reader sends the EPCs™ to a computer running software called Savant™. Savant™ sends the EPC™ over the internet to an Object Name Service (ONS) database, which produces an address. The ONS matches the EPC™ to another server, which has comprehensive information about the product.

4C. This server uses PML (Physical Markup Language) to store data about manufacturers' products. Because it knows the location of the reader sending the query, it knows where the product was made. If an incident involving a defect or tampering arises, the source of the problem can be tracked and the products can be recalled.

5. If the unloading area contains an RFID reader, there's no need to open packages and examine their contents. Savant™ provides a cargo list, and the pallet is quickly routed to the appropriate truck.

6. SpeedyMart tracks the shipment through its own Savant™ connection. As soon as it arrives, retail systems are updated to include every item. In this way stores can locate their entire inventory automatically, accurately and at low cost.

7. Reader-enabled “smart shelves” can automatically order more product from the back room or the manufacturer. With such a system, the need to maintain costly “safety volumes” in remote warehouses is eliminated.



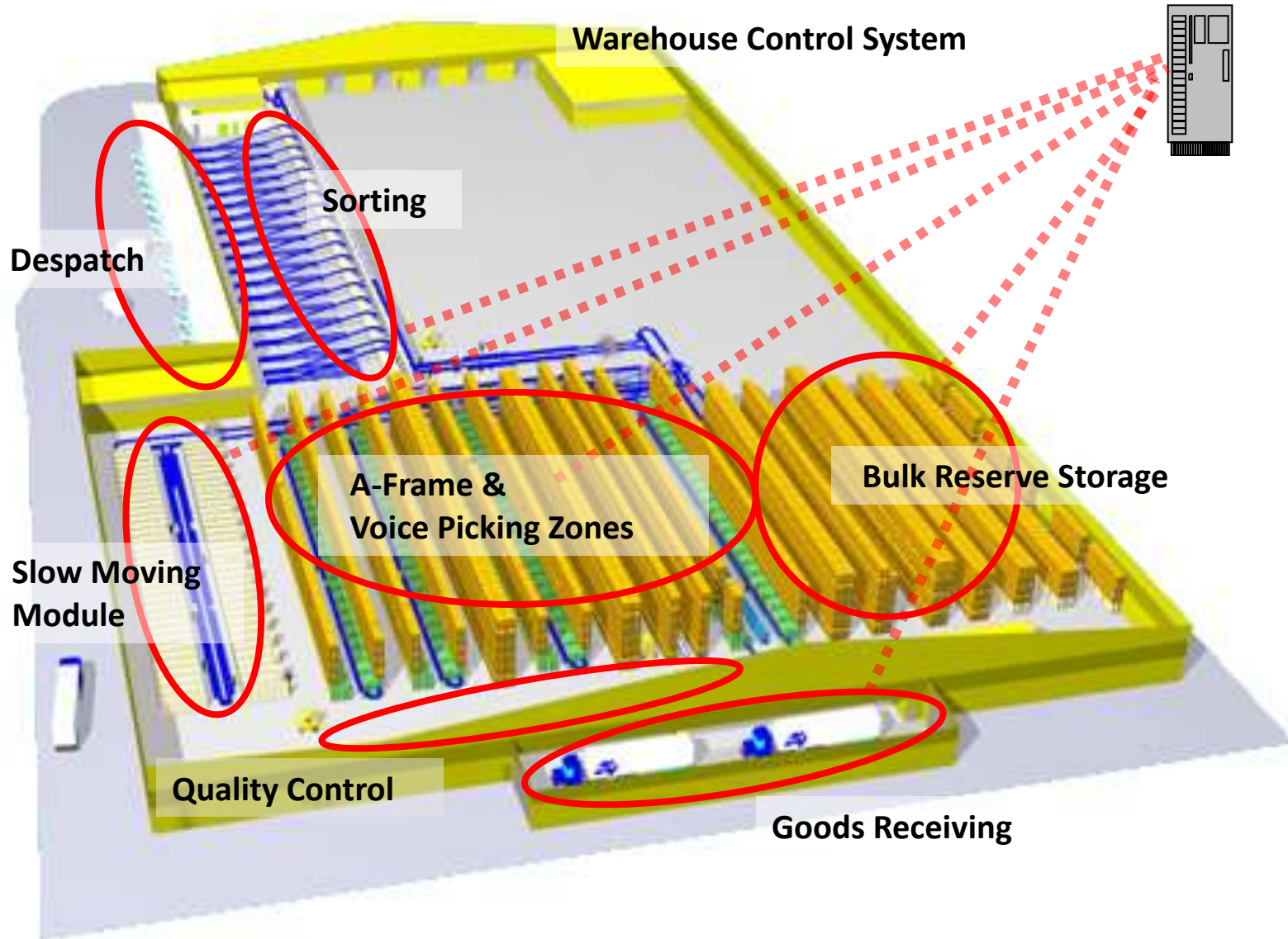
EPC Network – What?

ETags	The data carriers. RFID tags in various form factors, which carry EPCs.
Reader	The data capture device; portable or fixed (installed), connected to a Savant or network.
EPC	Electronic Product Code: the code carried by the data carrier; the globally unique pointer for making enquiries about the item associated with the EPC.
Savant	Servers which act as local repositories for EPCs and associated information, and which support sophisticated, flexible middleware for serving PML queries.
ONS	Object Name Service; the distributed resource that “knows” where information about EPCs is held (just like DNS).
PML	Physical Markup Language; like XML, with XQL query structure to allow structured querying and reporting of EPCs and attributed data.

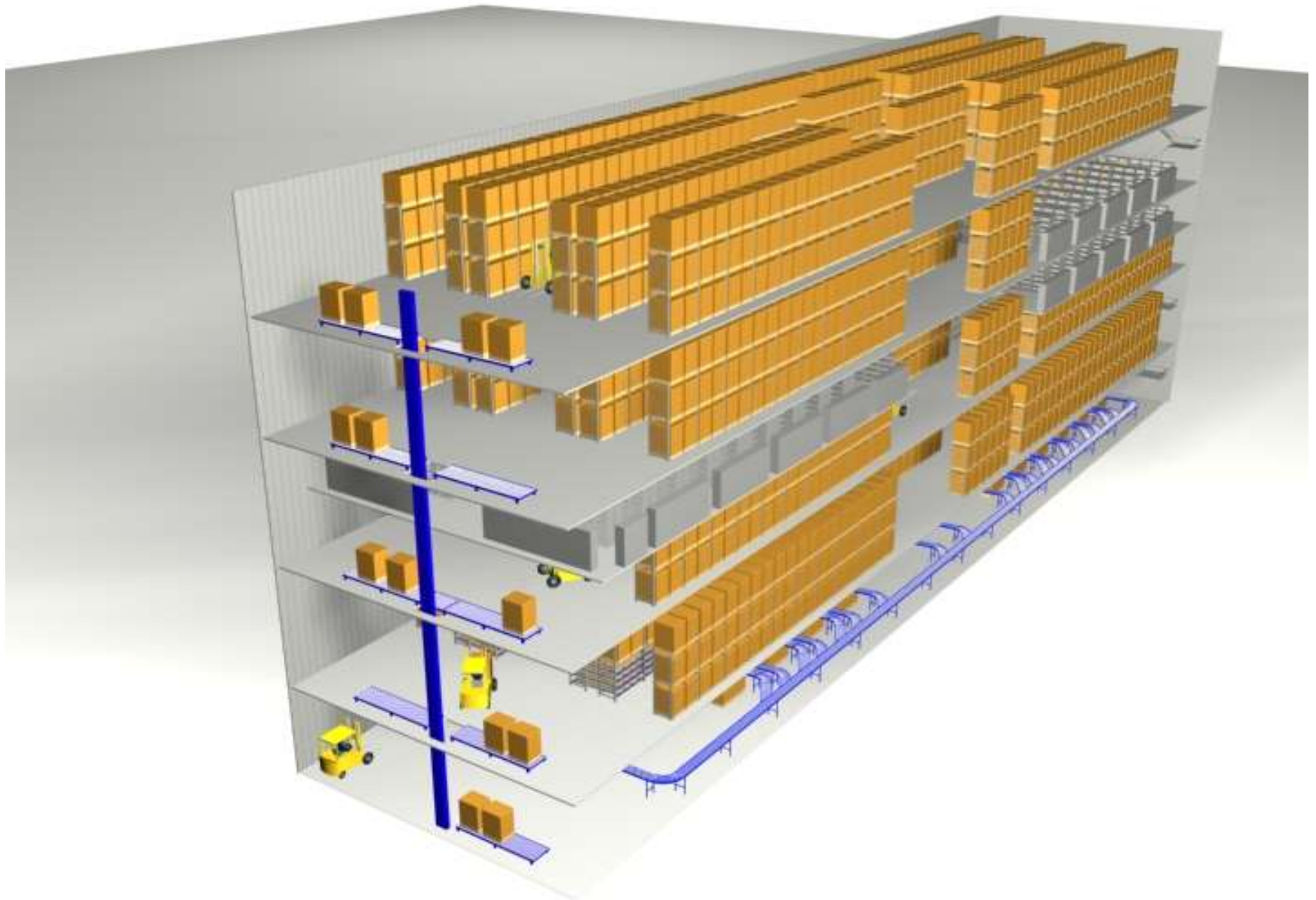
Features

- **Returns & Recall Management**
 - Companies could supplement the basic shipment identification information by writing the specific customer and time of shipment to the tag immediately prior to distribution.
 - In the event of a recall, companies could trace specific shipments to specific customers, which would enable a highly targeted notification and return operation and avoid a costly general recall.
 - For general returns, companies could verify that the customer returning merchandise is actually the customer who received it, which would deter counterfeiting and other forms of return fraud.

API: Best Practice Logistics System



Beijing Pharmaceutical: Best Practice in China

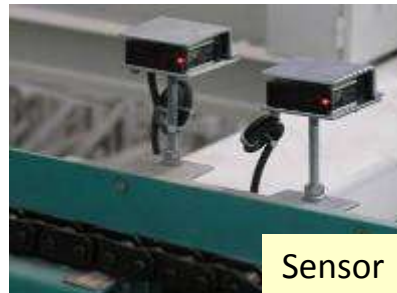




Roller conveyor



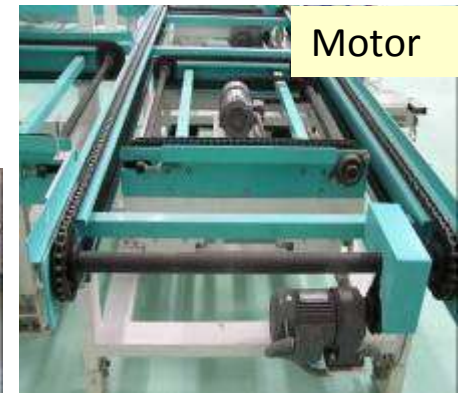
Dimension checking



Sensor

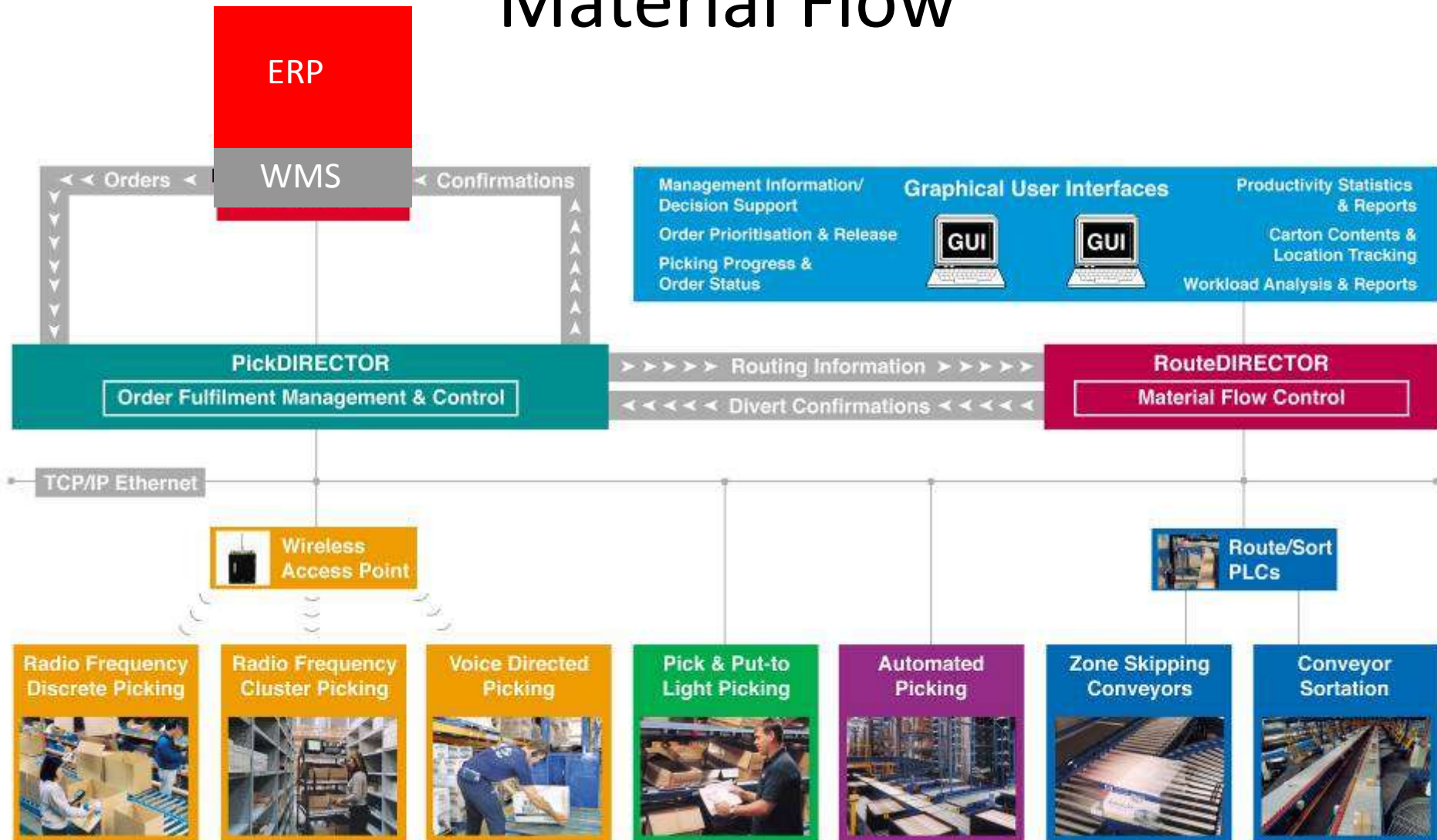


Photo Communicator
End Stopper
Contacting Bus



Motor

Real Time Order Management and Material Flow



Picking Technologies: Voice Picking



- New **Wireless** technology
- Provides good **Productivity** across SKU range
- **Hands-free, Eyes-free** Picking
- Multiple Orders per Zone enables **High Throughput**
- Cost is Proportional to the Number of Pickers
- Highly **Flexible**
- And highly **Accurate**

Picking Technologies: Pick-to-Light



- An older, hard wired technology with greatly enhanced functionality
- Ideal for **Fast Moving** Items
- Exceptional **Productivity**
- **Hands-free, Eyes-free** Picking
- Highly **Accurate**
- **Real-time** Management Updates
- Cost is Proportional to the Number of SKUs under Lights

Picking Technologies: RF enabled Cluster Picking



- Combines RF and Pick to Light to enable cluster picking.
- Improves **Productivity for Slow Moving** items
- Multiple orders picked in single Pass of stock locations
- **Real-time** Updates
- **Flexible** in Dealing with Changing Workloads

Picking Technologies: Vertical Carousel



- **Goods to the man** technology
- Effective Storage for:
 - **Temperature Controlled SKUs**
 - Medium Movers
- **Clean Storage** environment
- Excellent Use of Headroom
- Combine with PTL or Voice for Productivity & Accuracy
- Large Incremental Investment

Picking Technologies: A-Frame

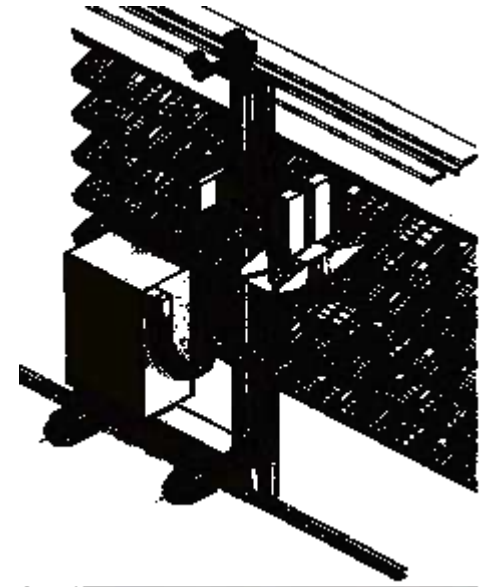


- **Fully Automated** Picking
- Excellent **Productivity and Throughput**
- Suited to **Very Fast Moving Items**
- Only Applies to SKUs with Suitable Pack-types
- Large Incremental Investment

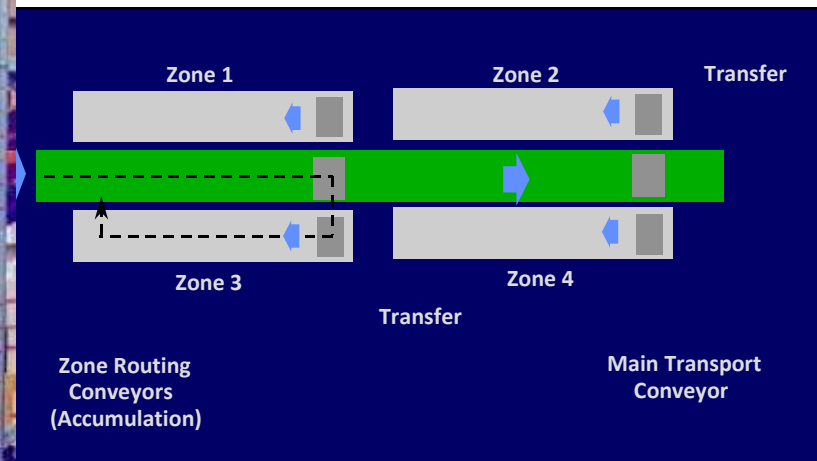
Picking Technologies: Picking and Replenishment Robots



- **Fully Automated Picking**
- Suited to **Medium Moving Items**
- Multiple grips to handle variety of container shapes
- Large Incremental Investment



Material Flow: Conveying and Zone Skipping





Material Flow: Sortation & Despatch



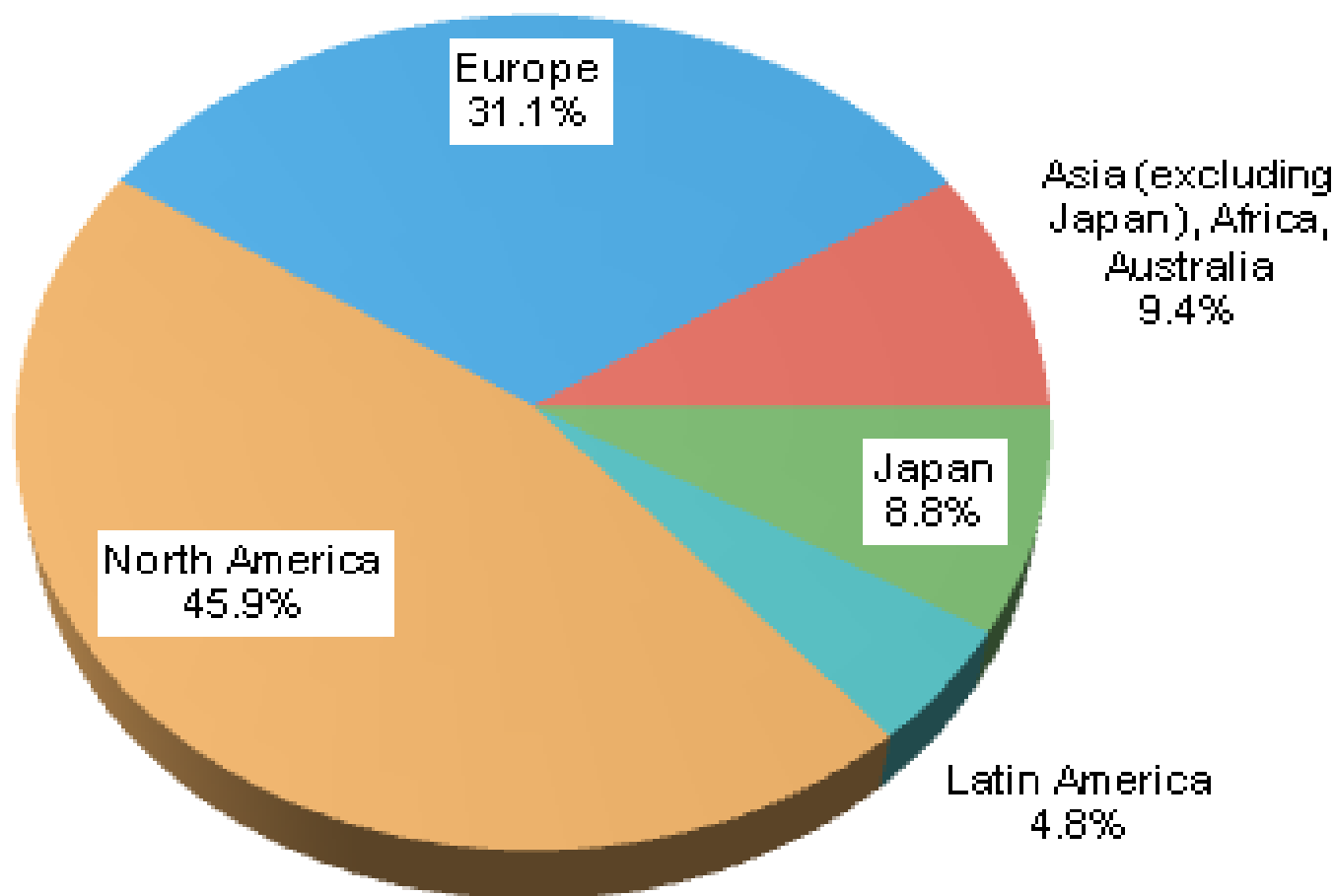
- **Linear and Recirculating** Sorting Technology
- Complete range from **low to high throughput**
- Sophisticated controls technology
- Full **integration** with Material Flow software
- Facilitates **Batch Picking & Cross Docking**

- تامین سرمایه و سرمایه گذاری کلان
- آموزش و تربیت نیروی انسانی

- این اقدامات در فضای اقتصادی هدفمندی یارانه ها و افزایش هزینه ها باید صورت پذیرد بنابر این بایستی علمی و بهره‌ور باشد.

World pharmaceutical market

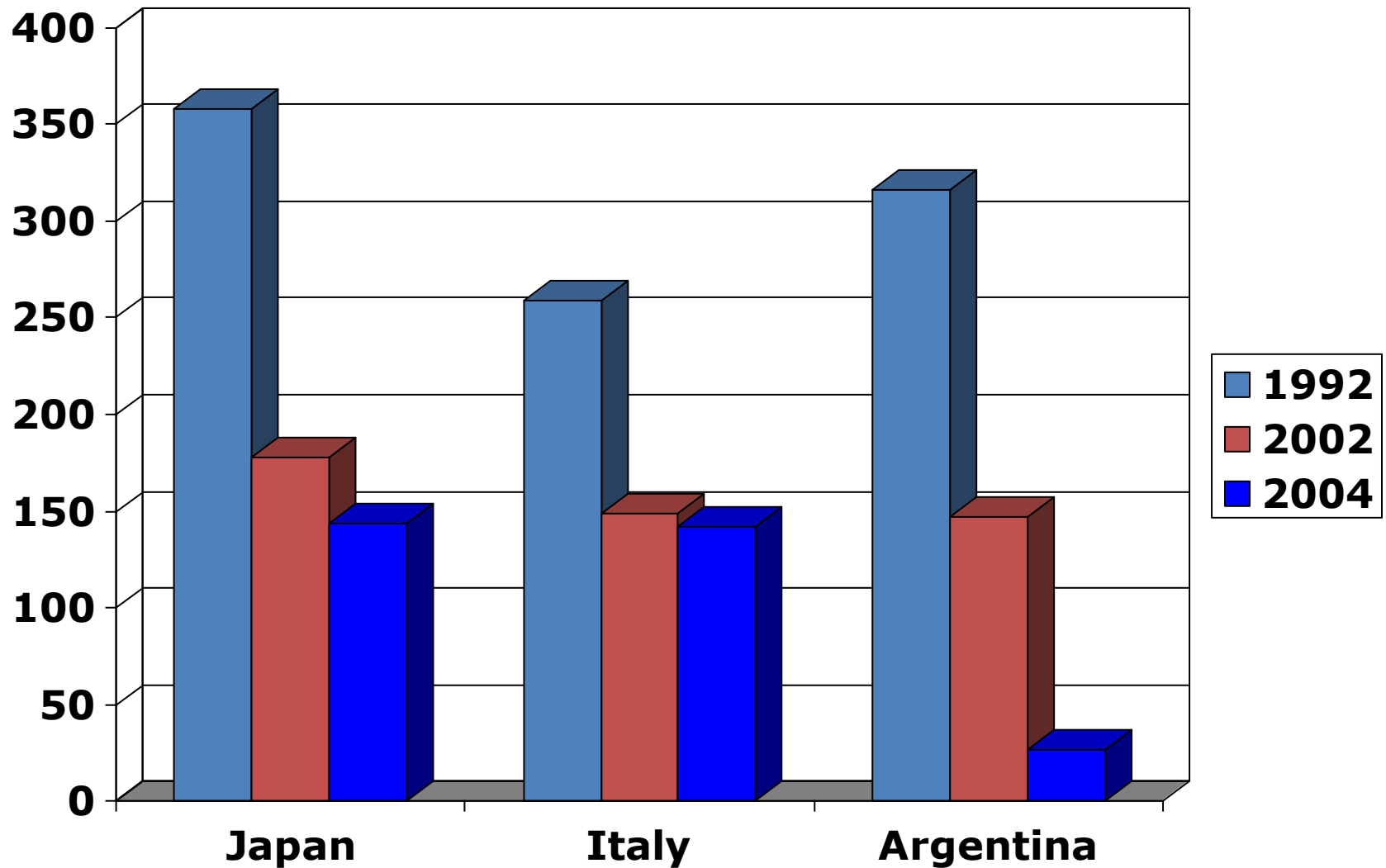
Percentage of global pharmaceutical sales, 2007



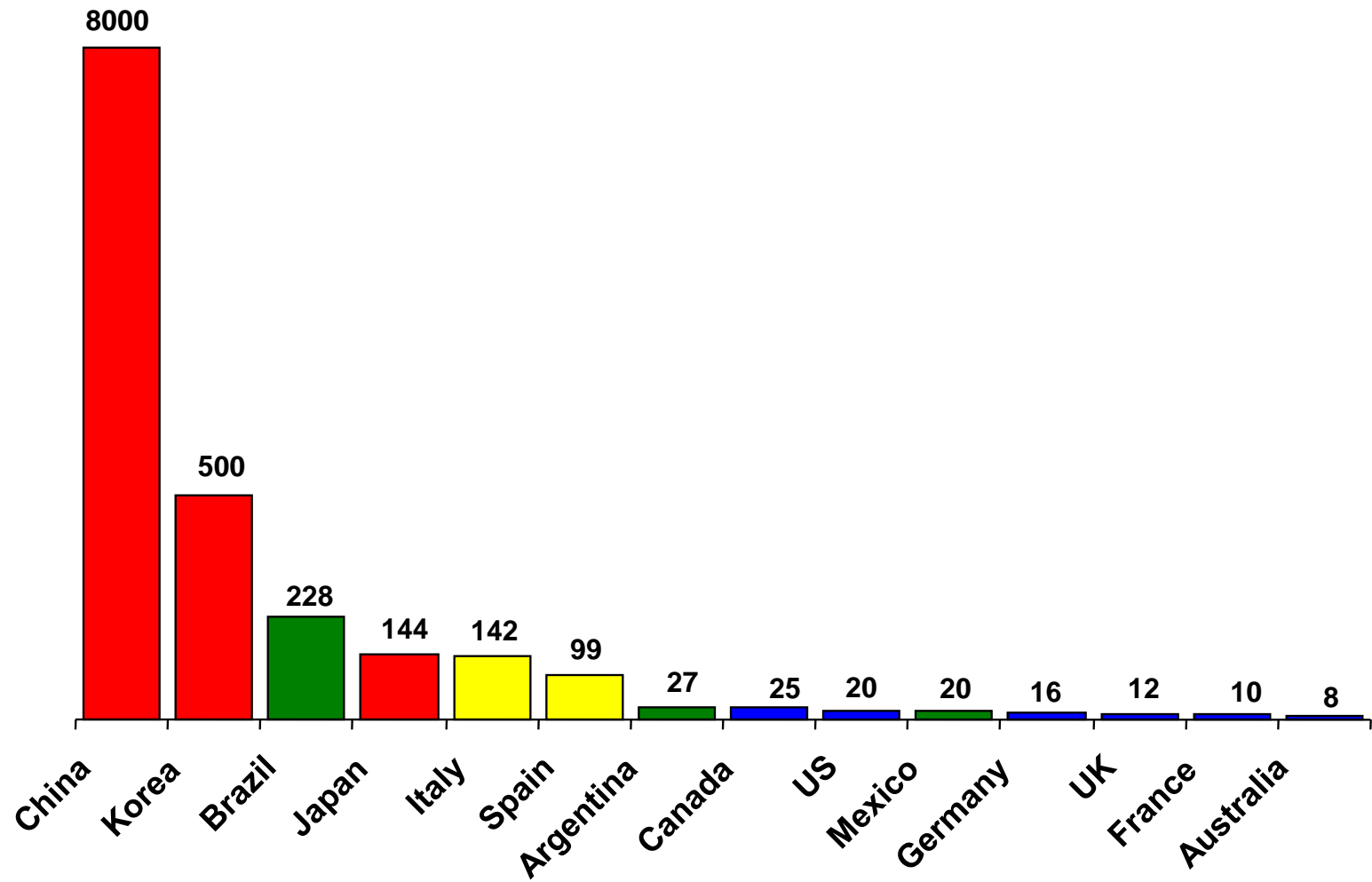
Note: Pharmaceutical sales totaled \$663.5 billion in 2007.

Source: "2007 Global Sales and Prescription Information," February 2008, IMS Health

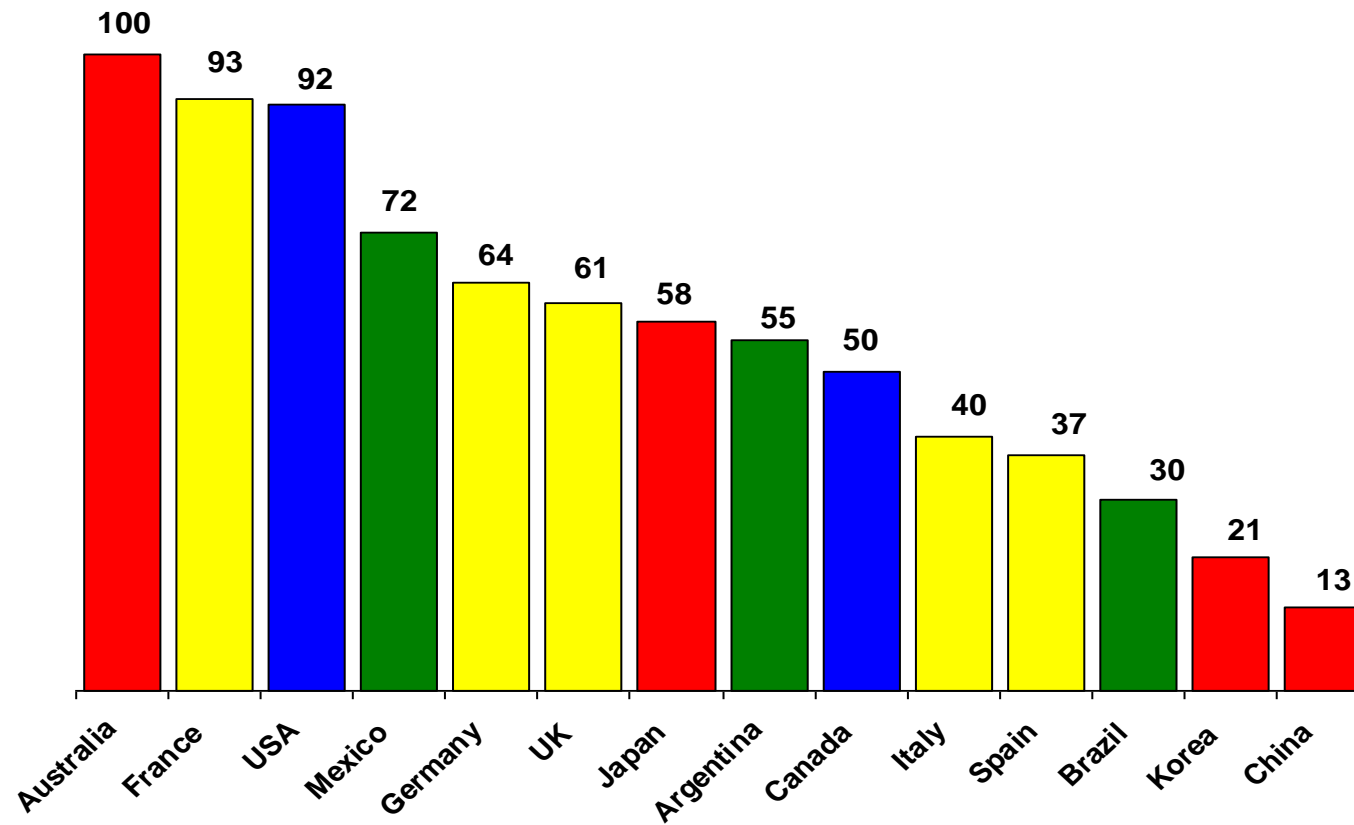
Wholesaler concentration is a global trend ..



The number of wholesalers 2003



Market share of top 3 wholesalers



Top Nine Leading Wholesalers 2004

- McKesson US
- Cardinal Health US
- AmerisourceBergen US
- Celesio Pan-European
- Phoenix* Pan-European
- Alliance Unichem Pan European
- Kurayasanseido Japan
- Suzuken Japan
- Alfresa Japan

Selcuk Ecza Deposu is one of the leading drug distributors in Turkey, with a market share of 33.8% in 2006. The company, established in 1958, employs 4,500 people and distributes a variety of products to 18,500 pharmacies through its 100 warehouses. The company began an online ordering system from pharmacies in 2001, which was extended to all of the company's branches by 2003.

Pharmaceutical distribution and retail companies are concentrated in the west of the country, with vast rural areas of the east generally underserved. The situation with pharmacists reflects this trend, with many of them working as sales representatives for pharmaceutical companies. There are around 22,000 pharmacies in the country, with interests of pharmacists represented by the Turkish Pharmacists Association (TEB).

- افزایش سطح مقررات مربوط به کیفیت ارائه خدمات
 - افزایش تعداد داروها با فن آوری جدید تولید
- این داروها به شرایط خاص نگهداری و حمل و نقل نیاز دارند.
- افزایش اطلاعات بیماران و تولید بسیاری از فرآورده های
- Hi - tec در داخل کشور می تواند پراکندگی جغرافیایی مصرف داروها و لزوم پوشش گسترده تر خدمات توزیع را سبب شود

- صادرات و دسترسی به بازارهای منطقه
- توزیع Promotional material
- مدیریت جریان نقدینگی
- Logistic Service Providers (LSPs)

- تعداد شرکت های پخش زیاد نخواهد شد بلکه در رقابت سهمگین افزایش سطح خدمات و هزینه ها و افزایش هزینه های کیفیت این تعداد به صورت کاهشی به تعادل خواهد رسید.