

HOME CARE TECHNOLOGY UPDATE

EYE TO THE FUTURE...

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OBJECTIVES

- ✓ **LIST THE DIVERSITY OF TECHNOLOGY PRODUCTS AVAILABLE THAT WILL FACILITATE AGING ELDERLY IN PLACE.**
- ✓ **FORMULATE PARTNERSHIPS WITH TECHNOLOGY VENDORS TO BRING VALUE - ADDED SERVICES AND PRODUCTS TO YOUR CLIENTS.**
- ✓ **RECOGNIZE THE IMPORTANCE OF HOME CARE TECHNOLOGY TO THE EXPANSION OF BUSINESS OPPORTUNITIES.**

ICE BOX





**SMART
REFRIGERATOR**



VICTROLA



**MP3
PLAYERS**

**RHAPSODY
IN BLUE**



RAP



**HORSE AND
BUGGY**



**HORSE
POWER**



CAVEMAN



FISSION



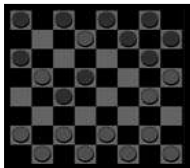
TELEPHONE



BLACKBERRY



CHECKERS



GAMEBOY



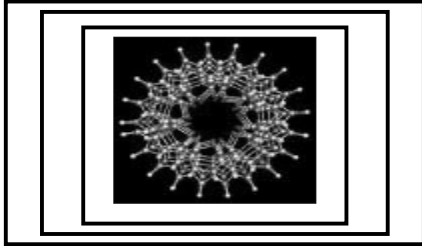
AGING POPULATION

- **BOOMERS: JAN. 1, 1946 - 1964, DEFINING THE BOOM OF BIRTHS AFTER WWII (PEAK YEARS 52-57)**
- **AGE 60-42 Y.O.**
- **75 MILLION IN THE U.S.**

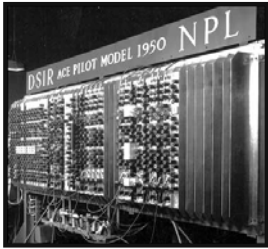
TECHNOLOGY TRENDS AND PRODUCTS

- **NANOTECHNOLOGY**
- **ROBOTICS/ARTIFICIAL INTELLIGENCE (AI)**
- **SMART HOMES AND SMART CHIPS**
- **TELEHEALTH**

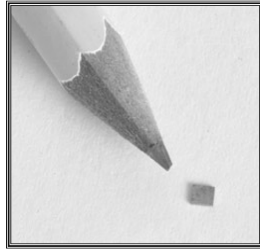
NANOTECHNOLOGY



THINGS HAVE CHANGED!



1950: COMPUTER IN LONDON



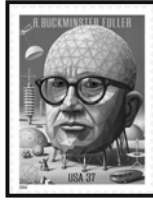
2004: COMPUTER CHIP

NANOTECHNOLOGY DEFINITIONS

- **NANO:** is Greek for midget and means one billionth of a part.
- **NANOMETER (NM):** is one billionth of a meter, 6 hydrogen atoms in a line make up one nanometer.
- **NANO-DEVICES:** 1-1000 NM

NANOTECHNOLOGY: TIMELINE

- **1986 R. SMALLEY**, Rice University described strange carbon molecules.
- Named molecules “Buckyballs and Fullerenes” after R. Buckminster Fuller.
- ✓ **BUCKIES**: Carbon 60 molecules fitted with radioactive products
- ✓ **FULLERENES**: Deliver drugs to the molecular level for osteoporosis, neurological diseases, and cancer.



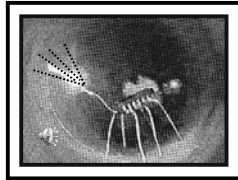
SISTER FIELD: M.E.M.S. MICROELECTROMECHANICAL SYSTEMS

SIZE

1000 - 10,000 nm

TINY ROBOTS

with manipulator arms that can flow through the blood and deliver drugs and repair tissues.



NANOBOT

NANOTECHNOLOGY PRODUCTS

- **2015 NSF predicts \$1 trillion in Nano-related goods:**
 - > **NANO-DRUGS**
 - > **NANO-TILES**
 - > **NANO-FABRIC**





ROBOTICS AND ARTIFICIAL INTELLIGENCE (AI)

ROBOT DEFINITIONS

❖ **ROBOT:** An automatic device that performs functions normally ascribed to humans; or a machine in the shape of a human.

❖ **ROBOTICS:** The study and use of robots.



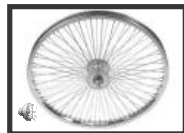
ROBOTS HAVE CERTAIN FEATURES:

• **ACTUATORS** Hardware in the form of moving parts like wheels, legs, wings or fins.



• **CONTROL SYSTEMS** to control what the actuators do.

• **SENSORS** that allows them to do intelligent things.



ROBOTICS TIMELINE

- 1495 LEONARDO DA VINCI DREW UP PLANS FOR A MECHANICAL MAN.
- 1921 WORD ROBOT FROM PLAY "RUR" BY CZECH WRITER, KAREL CAPEK, COINED WORD ROBOT FROM A CZECH WORD "ROBOTA" MEANING SLAVE LABOR.
- 1942 ISAAC ASIMOV: WHERE TERM ROBOTICS WAS FIRST USED.

ROBOTICS TIMELINE

- ◆ 1950 ISAAC ASIMOV: "I ROBOT" A COLLECTION OF ROBOT STORIES. HE ALSO WROTE THE 4 LAWS OF ROBOTICS.
- ◆ LATE 1950'S, EARLY 60'S: FIRST INDUSTRIAL MODERN ROBOTS, JOE ENGELBERGER WAS THE FIRST TO MARKET ROBOTS, SO HAS BEEN CALLED THE "FATHER OF ROBOTICS".



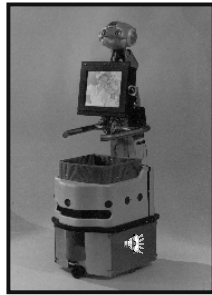
MOVIE: "I ROBOT"

- Combination of Capek's Play "RUR" and Asimov's 1950 play "I ROBOT" stars Will Smith.
- "USR" is the company in this movie stands for UNITED STATES ROBOTICS
- "NANYTES" used to disable the lead computer with an electrolyte solution that erases memory.



“ THE NURSEBOT PROJECT ”

- **NSF PROJECT WITH THE U. OF PITTSBURGH, CARNEGIE MELON U. AND U. OF MICHIGAN.**
- **JUDITH MATTHEWS, PHD, MPH, RN, UNIVERSITY OF PITTSBURGH, AND SEBASTIAN THRUN, PHD, CARNEGIE MELON/STANFORD.**
- **THE FIRST PROTOTYPE ROBOT WAS NAMED “FLO” AFTER FLORENCE NIGHTINGALE. THE SECOND PROTOTYPE WAS NAMED “PEARL.”**



“FLO”
Pittsburgh, PA based

ROBOTS IN HEALTH CARE

- ✓ **MICHAEL E. DEBAKEY VA MEDICAL CENTER, HOUSTON** Uses two **AETHON** robotic carts, to deliver medications to all floors of their 350 bed hospital. Speaks two languages, Spanish and English.
- ✓ **SAINT JOHNS RIVERSIDE HOSPITAL IN YONKERS, NEW YORK** also uses a robotic cart to deliver medications, that even sends for the elevator and communicates with people in its way. Security ensured by fingerprint ID. Robot is named **“SPENCER.”**



Aethon: Tug
HelpMate
Pittsburgh, PA based

ROBOTS IN HEALTH CARE

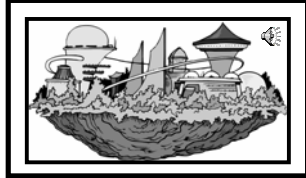
- ✓ **GEORGE WASHINGTON UNIVERSITY HOSPITAL: STEPHEN EVANS, MD, FACS. PROFESSOR OF SURGERY USES A ROBOTIC SYSTEM NAMED “HERMES” AFTER THE GREEK MESSENGER GOD.**

- 5 ft. voice activated, that assists in laproscopic surgery.
- Adjusts picture quality
- Adjusts light source
- Adjusts gas flow to the abdomen.
- Takes snapshots and videos



“Hermes”

Smart Homes Smart Chips



Verichips

- Made by Applied Digital Solutions, Palm Beach, FL
- RFID: Radio Frequency Identification device
- Size of a grain of rice – holds patient medical record.



Anti-Malaria Wristwatch

- ❖ Lubbe from South Africa
- ❖ Watch - pricks the skin every 6 hours to measure a serum “signature vibration” of the malarial parasite.
- ❖ Changes needles easily.



Textronics TM

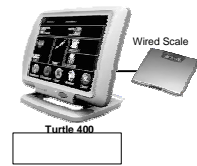
✓ Delaware Company

✓ NuMetrex: a sports bra that detects a woman's heart rate.

✓ T-shirt for men soon.



Telehealth Update



Technology Talk

ZOETM FLUID STATUS MONITOR

- Early evaluation of thoracic fluid
- FDA approved
- Used in HF disease management
- Uses 2 electrodes on sternum.
- Measures thoracic impedance of fluid in the chest in ohms = Zo

Normal = 19 - 30 ohms

Low Fluid Level = ↑ 30 ohms

High Fluid Level = ↓ 19 ohms