INSIGHT
Anticipating the Future... Assessing the Impact

IPRO 341

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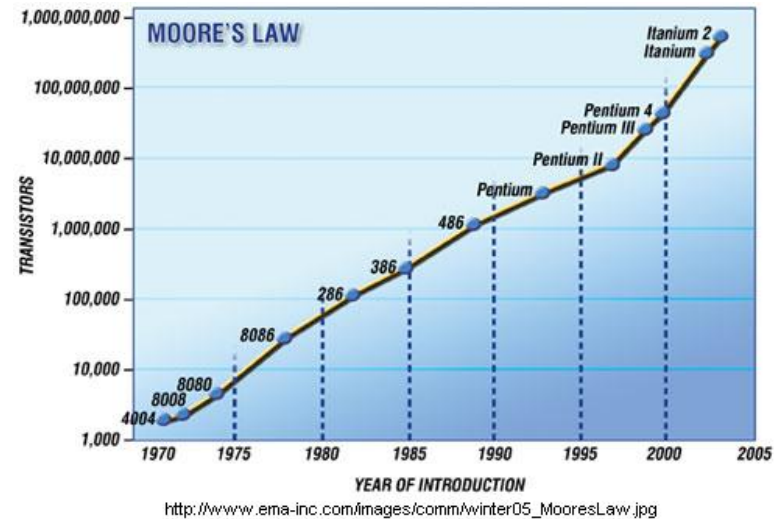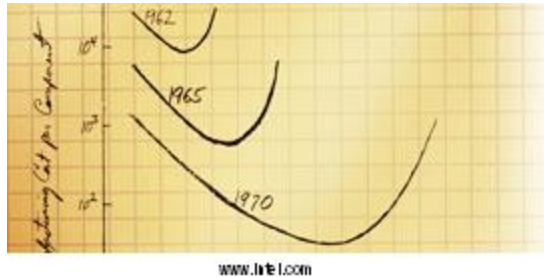
Library Instruction: Jeanne Link
Faculty Advisor: Janet Woerner

Presentation Agenda

- Introduction
- Team Purpose/Hypothesis
- What is nanotechnology?
- Team Structure
- Applications
- Stakeholder Analysis
- Conclusions
- Q&A

Introduction

www.intel.com

http://www.ema-inc.com/images/comm/winter05_MooresLaw.jpg

- Continuing from Fall 2005
- Nanotechnology
  - Why nanotechnology?
- Science is reaching the limitations of how small we can go…
- Unless….
- We start at the smallest element, the atom and molecule

Team purpose

- What is it?

- How it is used?

- What regulations if any?

- What information is already out there?

- What does the public know?

Hypothesis

- Hypothesis:
  - General public has the right to know opportunities and risks
  - Few sources of clear and unbiased information

What is nanotechnology?

- One billionth of a meter

- Mechanical, Electrical, and Chemical properties are different at the nanoscale

Foresight Institute:
--Virus Finders by Jeff Johnson

Potential Risks!

- Toxicity
- Nano-particles can enter our body
- No regulation
  - Privacy issues
  - Ethical issues

Team structure

- Applications research
  - Examples of how nanotechnology affects lives
- Stakeholders research
  - Examples of how much or how little is known about how these applications are affecting lives
  - What are the stakeholders telling people about this technology?
- Legal Perspective – Ad Hoc Law Student
  - It is an underlying issue in both categories

Consumer Goods

- Sporting Goods
  - Golf Balls
  - Tennis Balls
- Cosmetics
  - Skin cream
  - Suntan lotion
- Auto Wax
- Cloths
  - Eddie Bauer
  - Lee Jeans

http://www.eagleone.com/pages/products/category.asp?ckl=5015

http://www.garrisonsportsgroup.com/images/thumbnails/wilson_allcourt_200x250.jpg

http://www.eddiebauer.com/eb/product.asp?cm_cg=T1&product_id=22950

http://www.smalltimes.com/images/cosmetics_inside_2.jpg

Medical

- Drug Delivery Systems
- Diagnosis Systems
- Bandages

KILLS HARMFUL GERMS AND BACTERIA

http://www.utopiasilver.com/images/curad/curad2.jpg

DNA

Nanotube

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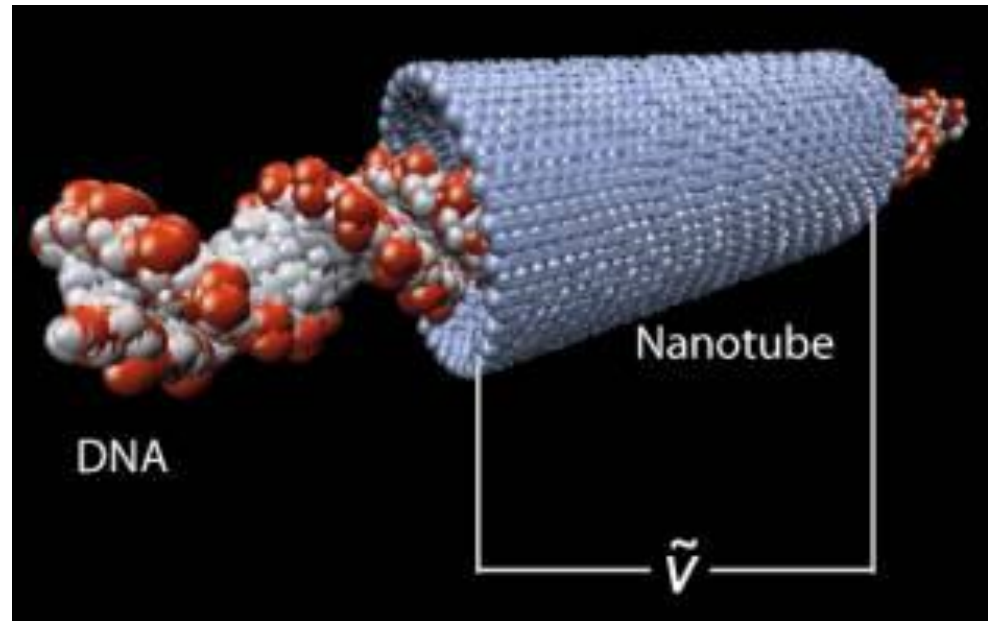
http://shasta.mpistuttgart.mpg.de/research/highlights/Highlight_DNACNT_files/image006.jpg

Military

- Stronger Weapons
- Personal Armor
- Vehicle plating
- Engine efficiency

"The Future Force Warrior will be a Formidable Warrior in an Invincible Team, Able to See First, Understand First, Act First, and Finish Decisively."

- US Army Natick Soldier Center: Future Force Warrior Program

--Office of Naval Research: Future Naval Capabilities

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Electronics

- Molecular Electronics
  - Carbon nanotubes
  - Nanowires
- Power Systems
  - Electrochemical power systems
  - Nano-based batteries
- Circuit Components
  - Transistors
  - Diodes
  - Logic Gates
- Quantum Computing
  - Magnetic Random Access Memory (MRAM)
  - Read heads for optical drives
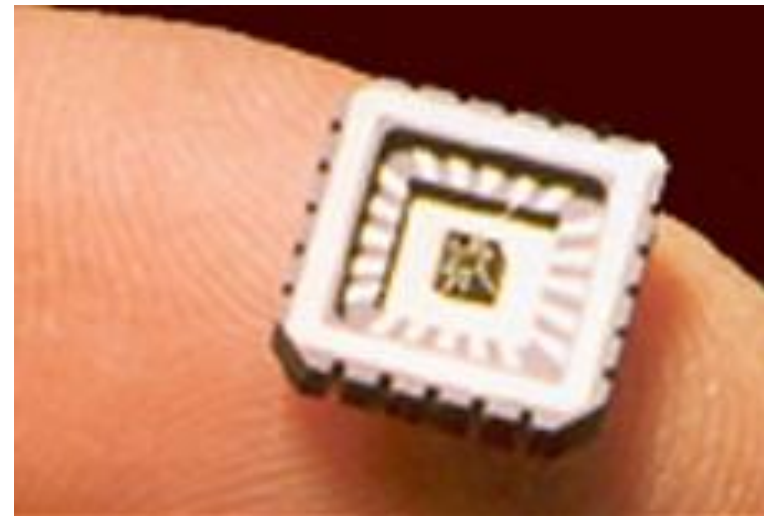
http://www.fz-juelich.de/iff/pics_pdfs/iff/elektronik_auf_mill1.jpg

Applications Conclusions

- New products offer more…

- BUT AT WHAT COST?

  – Potential Risks
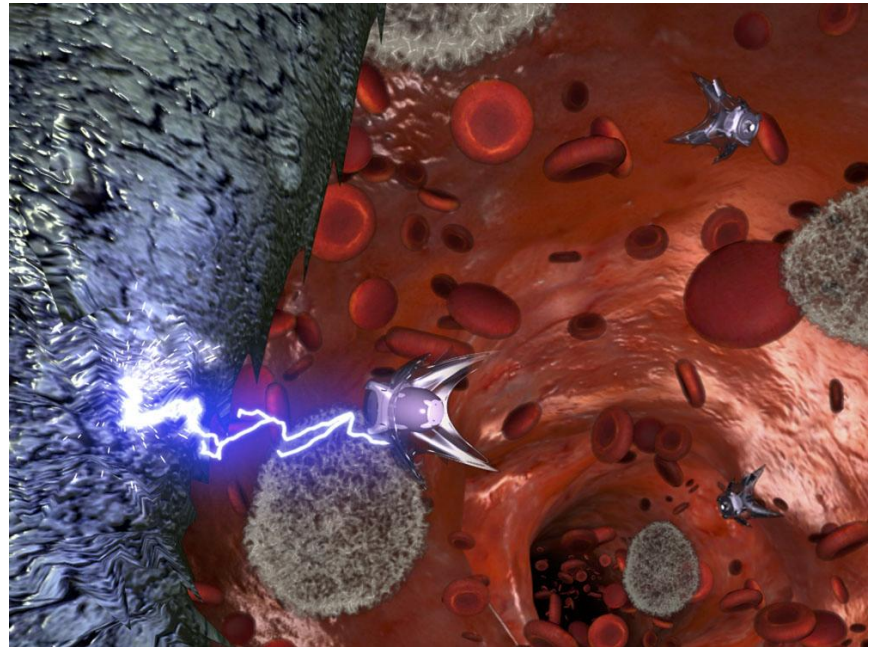
www.foresight.org/nanomedicine/Gallery/Images/battle.jpg

Stakeholders Research

- Government

- Commercial

- Academic

- Independent

Criteria for Evaluation

- **What is it?**
- What type of domain is it?
- Who authored the site?
- **Are they credentialed and are their credentials listed?**
- What is the geography of the cyberspace?
- Is information current and updated in a timely fashion? Is it "dusty?"
- What do others say?
- Sources well documented?
- Links and/or references to other sites?
- **All viewpoints represented and bias if any?**
- What organizations link to it?
- Is the page rated well in directory?
- **Reason for web page: inform, explain, persuade, sell, ethics, share, advocate, and other**

- All criteria was compiled from:
    - University of California at Los Angeles. http://www.library.ucla.edu/libraries/college/help/critical
    - Johns Hopkins University. http://www.jhu.edu/researchhelp/general/evaluating/
    - University of California – Berkley. http://www.lib.berkeley.edu/TeachingLib/

National Nanotechnology Initiative (NNI)

- LINKS TO:
  - Rice
  - Cornell
  - MIT
  - Northwestern
  - NASA
  - National Science Foundation
  - Department of Defense
  - Department of Energy

ZYVEX

- LINKS TO:
  - The Center for Biological and Environmental Nanotechnology (CBEN)
  - MIT's Institute for Soldier Nanotechnologies
  - National Institute of Standards and Technology (NIST)
    - Gave Zyvex a $25 million grant for the development of nano-assembly systems.

Other Sources

Perceptual map

Conclusions

- Each stakeholder has its own agenda to **promote and support**

- The information provided has a **bias on some level**

- Almost all funding could be traced back to **government money** (e.g. NNI) either directly or indirectly

Future of IPRO 341

- Create tool for public education
- Provide forum for public discourse
- Continue monitoring and evaluating nanotechnology

Special Thanks

- Dr. Friedman
- Beth Gore
- Dr. Peter Lykos
- Dr. Maritsa Poros
- Dr. Tillmans
- Dr. Vivian Weil
- O'Connor Design Works

Question and Answer

Team Members

- Ayo Ayodele   Political Science
- Saurabh Dass   Computer and Electrical Engineering
- Ankit Desai   Molecular Biochemistry and Biophysics
- Jason Frumkin   Computer Engineering
- Jonathan Komyathy   Computer Science
- Kevin R. Lerash   Political Science
- Jason Novak   Chemical Engineering (JD candidate)
- Maggie Peterson   Bio Medical Engineering
- Bezaleel I. Robinson   Computer Engineering
- Sagar Shah   Political Science
- George Skontos   Applied Mathematics
- Michael B. Stohl   Electrical Engineering
- Andrew J. Wilk   Computer Engineering
- Sungwoo Yang   Chemistry