A Better Society Through Computers

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With Special Thanks to Prof. Richard Ladner
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Instead, think of ways computers make the society better

Today:
- Assistive Technologies help people with disabilities
- Crowd Sourcing harnesses the power of the people
Who’s Considered Disabled?

- 650 million people worldwide
  - Sight: blind, low vision, color blind
  - Hearing: deaf, hard of hearing
  - Speech: limited ability to speak, stuttering
  - Mobility: limited ability to walk, use hands, arms
  - Cognition: dyslexia, short-term memory loss, dementia
  - Multiple: deaf-blindness
Assisting The Blind

Ray Kurzweil built first text-to-speech machine

- Think of the problems
  - High resolution scanning of documents
  - Character recognition from bits (OCR)
  - Word identification
  - Speech Synthesis
  + a zillion tough tech problems in between

AMAZING!
Stevie Wonder said: "The Kurzweil Reading Machine was a breakthrough that changed my life. With the Kurzweil Reading Machine, I could read anything I wanted with complete privacy: music lyrics, letters from my children, the latest best sellers and magazines, memos from my business associates. It gave blind people the one thing that everyone treasures, which is independence."
Expanding Technologies

https://www.youtube.com/watch?v=TOwDzDnd9NY

KNFB Reader

Prismo for iPhone

Bookshare
Deaf people need to type/read text when communicating over a distance … since the invention of the acoustic modem in the ‘70s this has been possible, but only now is mobile
From The Examples ...

- Technologies designed to assist the disabled to function in society usually turn out to be extremely useful to everyone!
  - Telephone
  - Texting
  - OCR
  - Speech recognition
  - Speech synthesis
  - Electric toothbrush
  - Sidewalk curb ramps and on and on and on and on ...
What Else Can Be Done – Lots!

- How about ASL over a smart phone?

Tough problems: Bandwidth, Computer Speed, Battery Life
Don’t think of disabled people as a medical, educational or social “problem” ... think how tech can let them live WELL with a disability.

Assisting The Disabled Is Right!
First: Their Lives Are Better
Next: Everyone’s Life Is Better
Crowd Sourcing

- Crowd sourcing is a distributed problem-solving and production technique
  - Problems are broadcast to an unknown group of ‘solvers’
  - ‘Solvers’ – the crowd – submit solutions that become the property of the broadcaster
  - They are compensated in some form -- money, prizes, community accolades, intellectual satisfaction and/or skill development
- Computers are the perfect ‘agent’ for this!
Crowd sourcing doesn’t need computers ...

The Oxford English Dictionary (OED), started in 1857, is an example. (It has EVERY English word in it; it’s so huge a person would need 120 years to type it in!)

OED gave a general call for people to find the earliest use of each word ... so, for example, *byte* was first used in 1964

1,000s and 1,000s of people have helped out, and continue to
More Familiarly ...

WIKIPEDIA
The Free Encyclopedia

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Contents
Featured content
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Byte
From Wikipedia, the free encyclopedia

Not to be confused with Bite or Bight. This article includes other uses, see Byte (disambiguation).

The byte /ˈbaɪt/ is a unit of digital information in computers, most commonly consists of eight bits. Historically, the byte has encoded a single character of text in a computer[1][2] as an addressable unit of memory in many computer architectures. It has historically been hardware dependent and no definitive size. The de facto standard of eight bits is a convention that, although

The database of knowledge
More Familiarly ...

- www.freerice.com

UN Food Program gets rice; Users learn vocab
More Familiarly ...

- www.kickstarter.com

- Entrepreneur gets presales; users get discounts
More Familiarly ...

- beamartian.jpl.nasa.gov

NASA processes data; user gets prizes, status
More Familiarly ...

- fold.it [http://vimeo.com/focusforwardfilms/semifinalists/51888393]

- AIDS research furthered; users get status!!!
What other crowd sourcing activities are you familiar with?
Types of Crowd Sourcing

- What other crowd sourcing activities are you familiar with?

- What types of crowd sourcing do the examples illustrate?
Why Does Crowd Sourcing Work?

- People bring a variety of skills to the problem –
  - Gamers may be better at 3D visualization than people selected for medical research knowledge
  - Motivation – Learning vocabulary and giving rice to UNWFP is better than learning vocabulary alone
  - Large supply of workers with nothing else to do –
    - Mechanical Turk exploits programming skills
    - Being a Martian is a “better” time waster than SuDoKu
  - Collective intelligence trumps a few smart people
- Participating in something new is FUN!
Computers and the Internet made crowd sourcing a powerful, easy-to-apply idea that makes the world better

- We may all be able (and eager to) contribute
- If “two heads are better than one” than a million heads are at least better than 500,000