Week 10

Crowdsourcing

Outline

- Why Crowdsourcing
- Examples of Crowdsourcing
- Challenges in adopting crowdsourcing for eGovernment
- Guest speaker: Mr. Gene Tan, Director, National Library Office & Programme Director, Singapore Memory Project, NLB

4 hot

STORIES BEHIND
Singapore Streets

Mr Gene Tan is heading the Singapore Memory Project, for which he has submitted about 20 memories, including those of his growing up years with his parents and three older siblings in a one-room flat (below left) in Circuit Road.

Every day is worth remembering

Let the memory live again

Cheryl Faith Wee

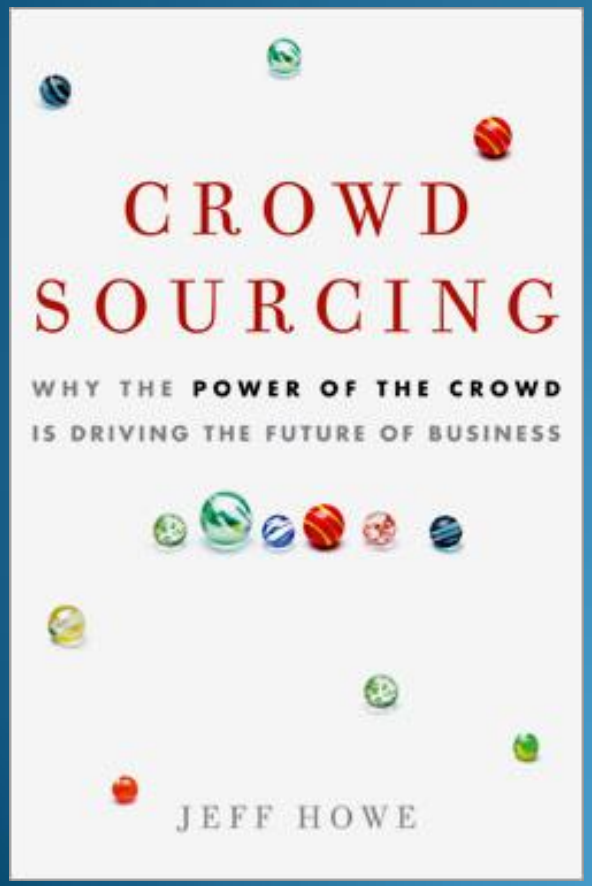
The Singapore Memory Project, run by the National Library Board and supported by the Ministry Of Information, Communications and the Arts, aims to collect five million memories by 2015.

LifeStyle talks to some of the contributors of the 230,000-plus memories, which were collected through interviews, social media and submissions from the public including handwritten postcards and old photographs.

E: cherylwfaith@sph.com.sg

To submit a memory, go to www.singapore memory.sg, e-mail inquiries@sgmemb.gov.sg or go to the Remember SG Facebook page. Or submit through the iPhone application SingaporeMemory.SG, which will be available on the Apple App Store next month.

Why Crowdsourcing



Crowdsourcing

- Wikipedia's definition
  - A distributed problem-solving & production process that involves outsourcing tasks to a network of people (aka 'the crowd') through an open call
  - Process can occur online and/or offline

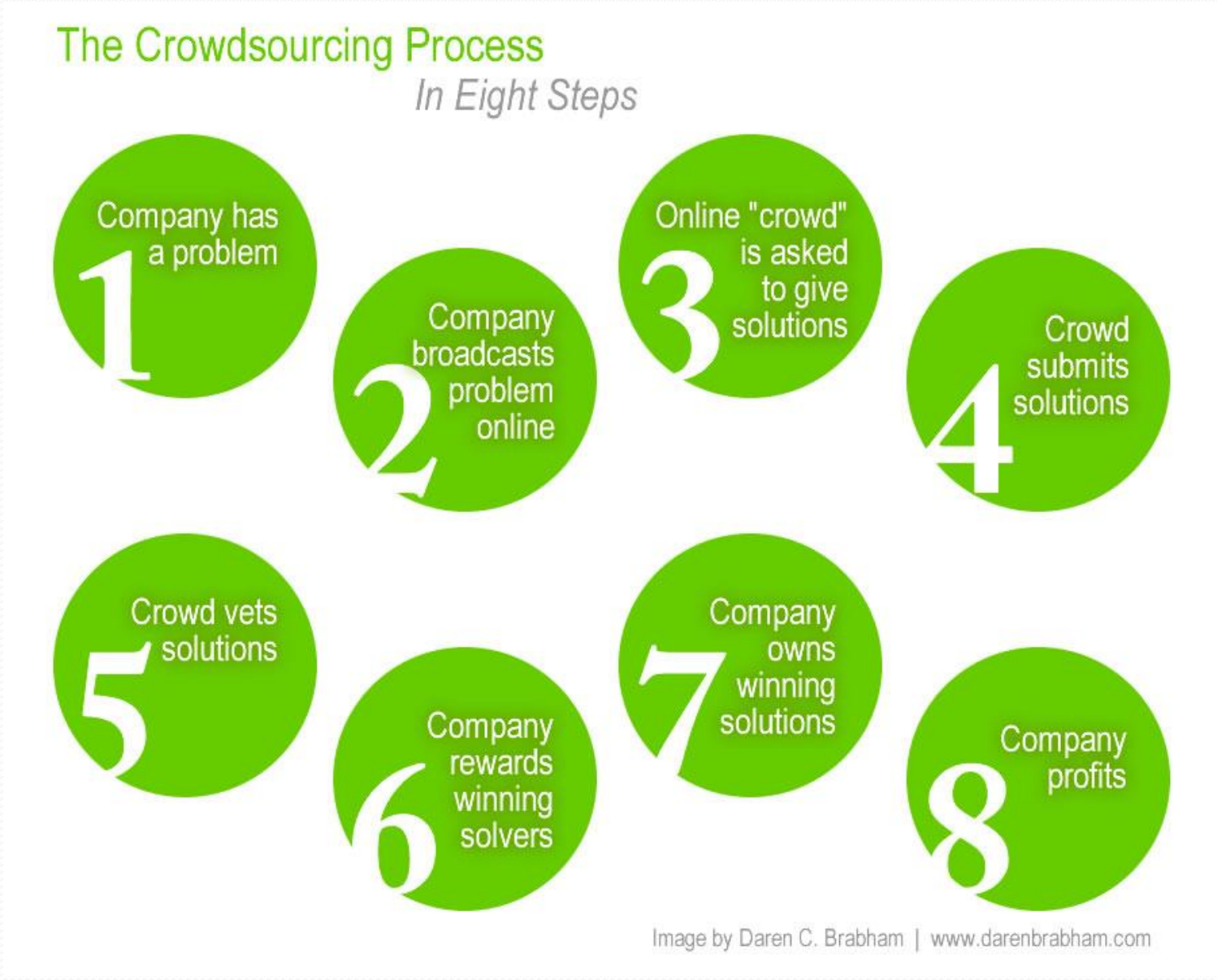
- Jeff Howe's definition (2006)
  - "… represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call"

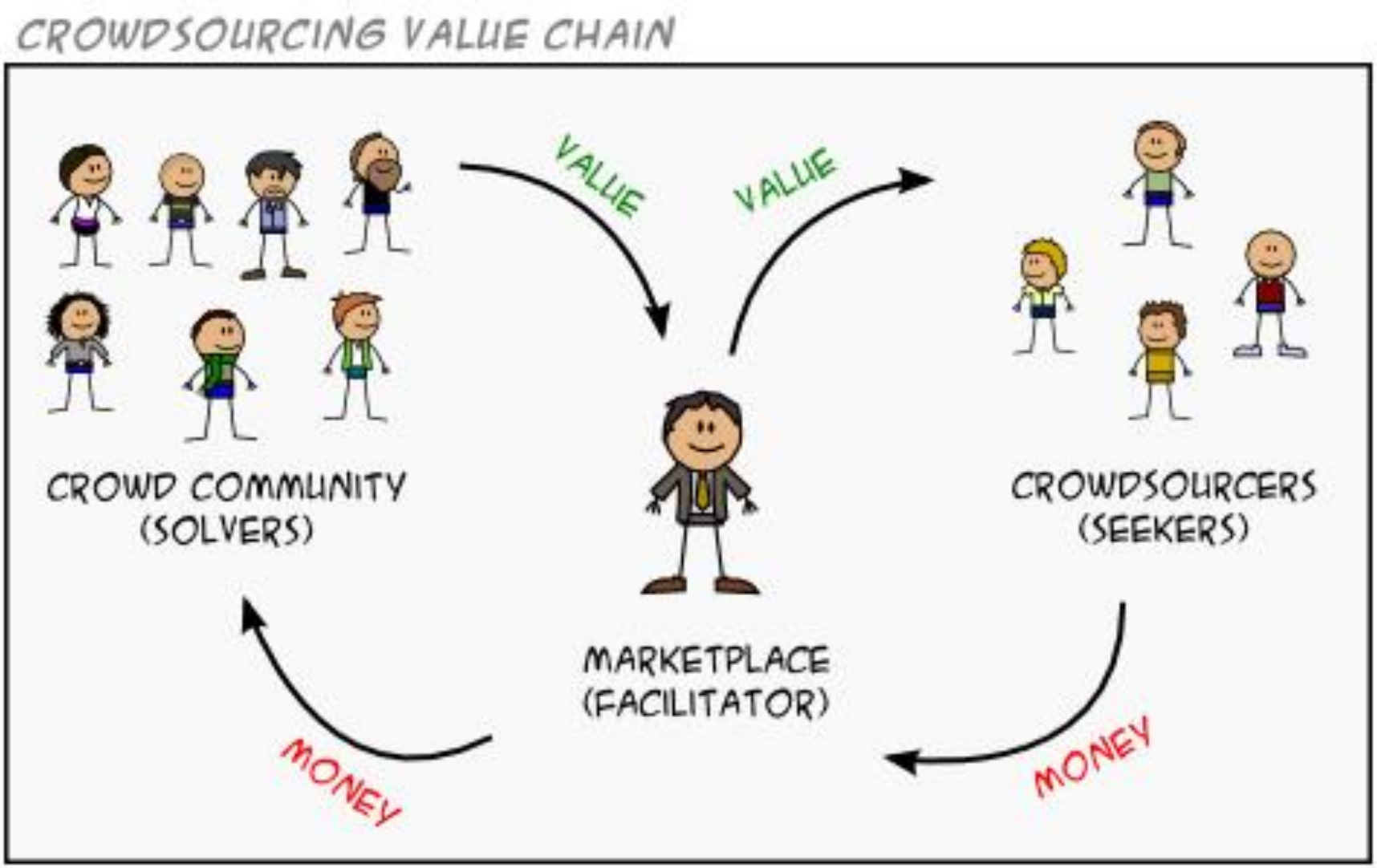
Characteristics

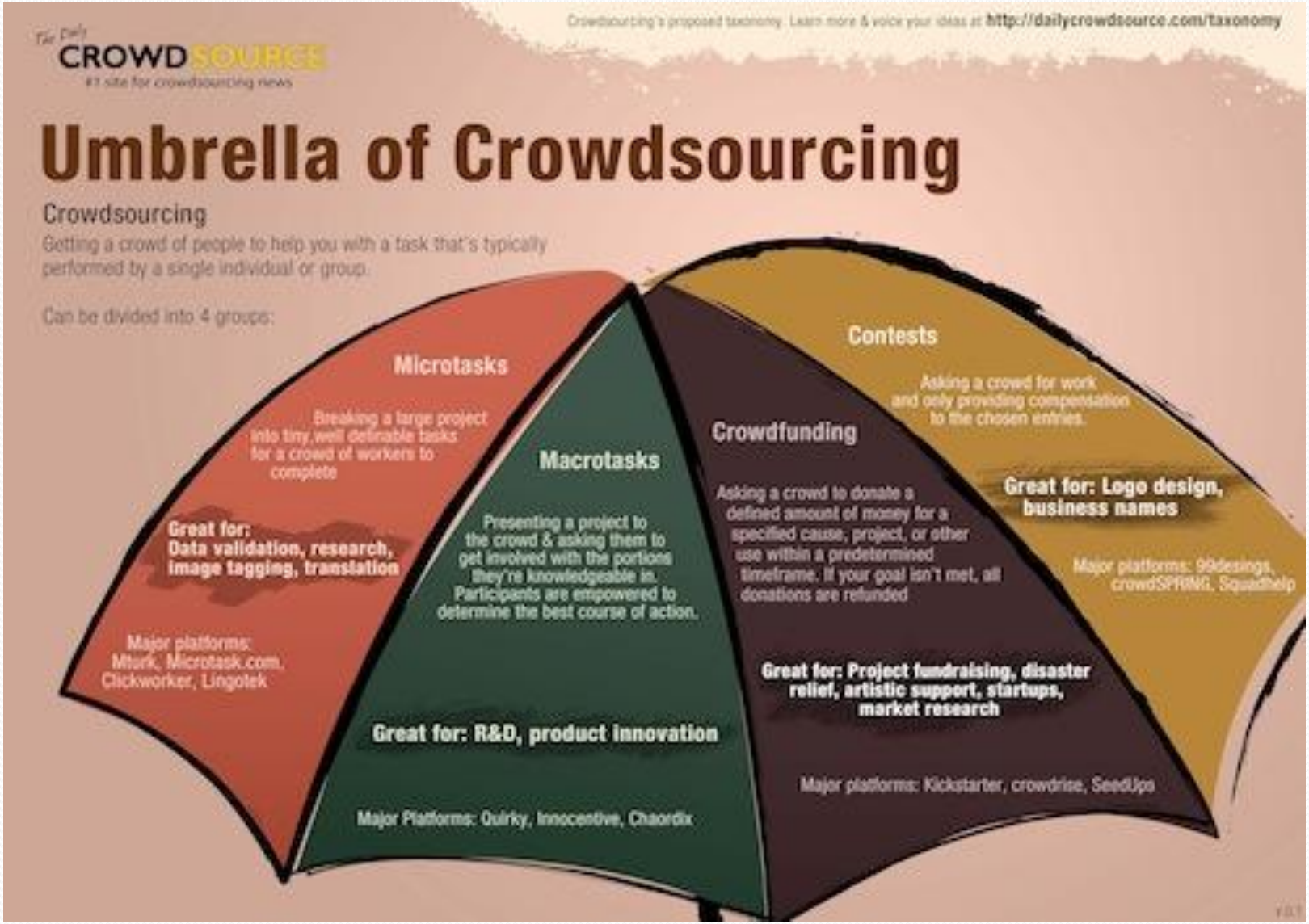
- Collaboration of large groups of people via Internet
  - Speed, reach, anonymity, opportunity for synchronous engagement & ability to use many forms of media content
- Makes use of creative, productive capabilities of online community for specific purposes
- An organization issues a task to an open online community
  - Community participates in accomplishing task for benefit of organization
  - Blends an open creative process with a top-down managed process
- Crowds with a participatory culture
  - Members "believe their contribution matter & feel some degree of social connection with one another"

What It is Not

- Not a term that applies to just any instance of an online community
- Not a concept that has been around since before the Internet
- Not “open source” production
- Not “open innovation”
- Not a model for making model online
- Difference between crowdsourcing & outsourcing
  - A task or problem is outsourced to an undefined public rather than a specific other body

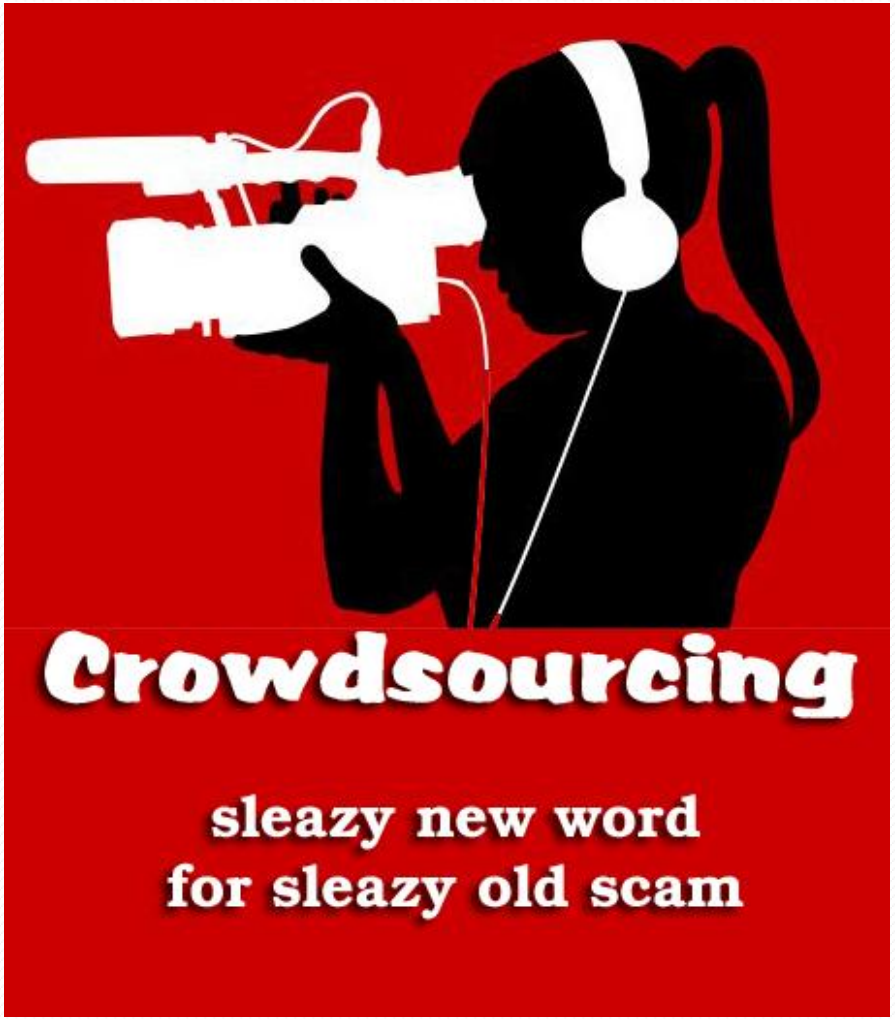

The Crowdsourcing Process
In Eight Steps
1 Company has a problem
2 Company broadcasts problem online
3 Online "crowd" is asked to give solutions
4 Crowd submits solutions
5 Crowd vets solutions
6 Company rewards winning solvers
7 Company owns winning solutions
8 Company profits
Image by Daren C. Brabham | www.darenbrabham.com


CROWDSOURCING VALUE CHAIN
VALUE
VALUE
CROWD COMMUNITY
(SOLVERS)
MARKETPLACE
(FACILITATOR)
CROWDSOURCERS
(SEEKERS)
MONEY
MONEY


The Daily CROWDSOURCE
#1 site for crowdsourcing news
Crowdsourcing's proposed taxonomy. Learn more & voice your ideas at http://dailycrowdsource.com/taxonomy
Umbrella of Crowdsourcing
Crowdsourcing
Getting a crowd of people to help you with a task that's typically performed by a single individual or group.
Can be divided into 4 groups:
Microtasks
Breaking a large project into tiny,well definable tasks for a crowd of workers to complete
Great for: Data validation, research, image tagging, translation
Major platforms: Mturk, Microtask.com, Clickworker, Lingotek
Macrotasks
Presenting a project to the crowd & asking them to get involved with the portions they're knowledgeable in. Participants are empowered to determine the best course of action.
Great for: R&D, product innovation
Major Platforms: Quirky, Innocentive, Chaordix
Crowdfunding
Asking a crowd to donate a defined amount of money for a specified cause, project, or other use within a predetermined timeframe. If your goal isn't met, all donations are refunded
Great for: Project fundraising, disaster relief, artistic support, startups, market research
Major platforms: Kickstarter, crowdrise, SeedUps
Contests
Asking a crowd for work and only providing compensation to the chosen entries
Great for: Logo design, business names
Major platforms: 99designs, crowdSPRING, Squadhelp

Skeptic's View

Crowdsourcing is getting low-pay or no-pay outside amateurs to do company work



Benefits

- “Democratize” process of idea generation & production
- Lower cost of doing business & spurring innovation

Motivations of the Crowd

- No single motivator applies to all crowdsourcing applications
- Seek opportunities to
  - Desire for financial gain, rewards & recognition
  - Develop one's creative skills
  - Network with other creative professionals
  - Socialize & make friends
  - Share with others
  - Express themselves
  - Build a portfolio for future employment
  - Challenge one to solve a difficult problem
  - Contribute to a large project of common interest
  - Enjoy all responsibilities & trappings of serious leisure
  - Pass time when bored

Types of Crowdsourcing

- Knowledge Discovery & Management Approach
- Broadcast Search Approach
- Peer-Vetted Creative Production Approach
- Distributed Human Intelligence Tasking

- Above typology is based on Daren Brabham's research

Knowledge Discovery & Management Approach

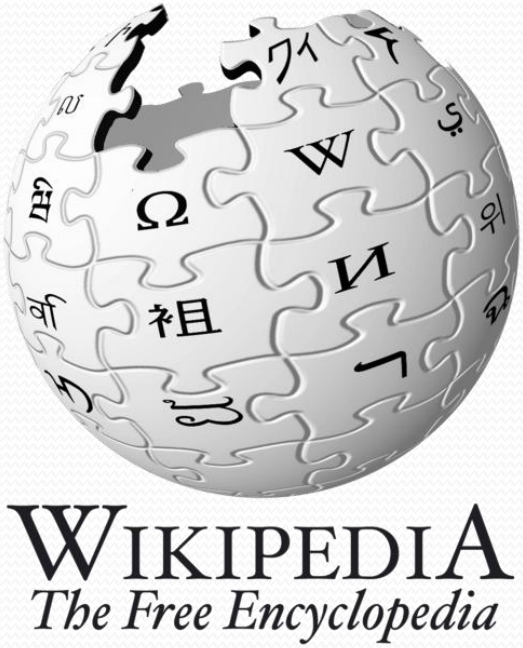
Examples

Overview

- Useful when wealth of disorganized knowledge exists in community & there is need to find & assemble knowledge in a coherent way
- Crowdsourcing organization
  - Tasks online communities to find this knowledge
  - Provides a framework to assemble & manage knowledge into a common repository & format
- Ideal for info gathering, organization & reporting problems e.g., creation of collective resources

Example: Wikipedia

- Has created new types of encyclopedias
- Has well-established pool of self-managing volunteers working with clear guidelines & policies
- Relies on decisions of editors for disputed articles
- Andrew Lih (author of "The Wikipedia Revolution")
  - "…collaborative accumulation of knowledge was not only feasible but desirable"
- Critics
  - "…but no one at Wikipedia issues specific tasks to online community & manages creation of articles"
  - More of "commons-based peer production"



Collecting Traffic Data

- Traffic management system, being developed by NTU that could improve monitoring of roads by using geo-location data captured from drivers' smart phones
- Project supported by IDA's 1st Call for Cloud Computing Proposals
- Status: Pilot phase

SINGAPORE ROAD TESTS SMART TRAFFIC CLOUD

By Robin Hicks | 9 December 2010

Singapore is trialing a traffic management system that could improve the monitoring of the city-state's roads by using geo-location data captured from drivers' smart phones.

GPS sensors in drivers' smart phones can determine the location, direction of travel and speed of vehicles. The GPS data, captured in real-time, is hosted on a cloud platform and can be used to monitor – and predict – traffic conditions.

"It would be very costly to deploy traffic sensors all over the city. Since traffic sensors are only available on highways and major roads, why not make use of GPS sensors in drivers' mobile phones to monitor traffic conditions?" said Dr Lim Hock Beng, Programme Director, Intelligent Systems Centre, Nanyang Technological University, who leads the research team behind the initiative.

PHOTOS

View photos

RELATED ARTICLES

- Singapore to launch mobile payment services
- Singapore to build more 'hassle free' hospitals
- Singapore Police reveals social media strategy

RELATED CATEGORIES

- GOVERNMENT CLOUD

FROM THIS SECTION

- NEWS

Existing traffic analytics tools, such as IBM's Traffic Prediction Tool (TPT), can achieve up to 85 per cent accuracy in predicting traffic volumne and speed 10 minutes ahead of time. "Traffic information collected via mobile phones can supplement the data from traffic sensors, and help to improve traffic prediction accuracy," said Dr Lim.

The Smart Traffic Cloud, supported by the Infocomm Development Authority (IDA) under the Open call for Cloud Computing, will be hosted on Singtel's Alatum cloud computing platform. The traffic data will be made available to application developer and users to develop novel location-based traffic applications.

On the question of privacy, Dr Lim noted that information on a driver's journey would be aggregated, and not linked to the driver's identity.

The Singapore team is collaborating with the University of California at Berkeley, which is working on a similar project in the San Francisco Bay Area.

Example: OpenStreetMap (1/2)

- A collaborative project to create a free editable map of the world
  - Inspired by Wikipedia
- Major driving forces behind establishment & growth
  - Restrictions on use or availability of map info across much of world
  - Advent of inexpensive portable Satellite navigation devices

Example: OSM (2/2)

- Maps are created using data from
  - Portable SAT NAV devices
  - Aerial photography
  - Other free sources
- Rendered images & vector dataset are available for download under a Creative Commons Attribution-ShareAlike 2.0 licence
- Map display features a prominent 'Edit' tab & a full revision history is maintained
- Registered users can upload GPS track logs & edit the vector data using free GIS editing tools

- Founded by Prof. Beth Simone Noveck (New York Law School)
  - When she led Obama Administration's open government initiative
- Opens patent applications, with permission of applicants, to
  - Allow public to contribute to research on "prior art" for no monetary reward
  - Prior art is any evidence that a similar invention already exists that would negate originality of a patent application
- Launched to help fix a patent system that is, by general consensus, broken
- Aims to accelerate work of US Patent & Trademark Office (USPTO) in determining which ideas deserve patents
  - Enables topic experts to conveniently contribute info that expedites official process
- 2-year pilot project in collaboration with USPTO completed on 15 June 2009

Status

- Initial pilot examined > 220 patent applications in fields of software & business methods
- USPTO undertook an evaluation of Peer To Patent
  - Assisted by students of Worcester Polytechnic Institute
  - Concluded that program had merit & should be continued
  - On 19 Oct 2010, USPTO & New York Law School announced a new pilot program from 25 Oct 2010 to 30 Sep 2011 (with review period extending thru 31 Dec 2011
  - Will include new subject areas
    - Telecommunications, speech recognition, translation, biotechnology, bioinformatics & biopharmaceuticals

Other Adoption

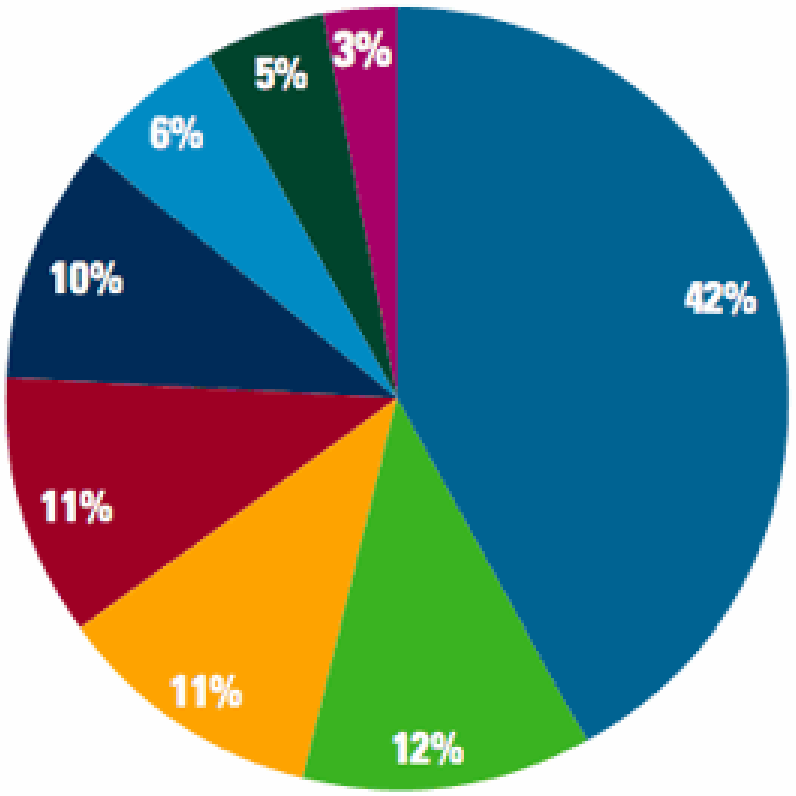
- IP Australia
- Japan Patent Office
- Korean IP Office
- UK IP Office
  - Pilot commenced on 1 Jun 2011

2-year Pilot Run (1/2)

- Metric: How popular system was to patent applicants & volunteer examiners
  - 2,600 people registered as patent reviewers
  - > 200 applications were vetted
    - 50% of upper limit of 400
    - Offered advantages to small & independent patent applicants who hope that well-vetted patents will save them trouble of legal challenges
      - Some 109 of applications came from 6 major firms like GE, IBM, & HP

2-year Pilot Run (2/2)

- Metric: How project sped up approval process & produced more solid patents
  - 69% of 54 USPTO patent examiners surveyed said that they think peer reviewing is beneficial to patent process
  - 12% percent said that prior art they got through Peer-to-Patent was not otherwise accessible to them
- In a USPTO survey, 59% of 26 examiners asked said that Peer-to-Patent was helpful in their work



PEER TO PATENT

in cooperation with USPTO

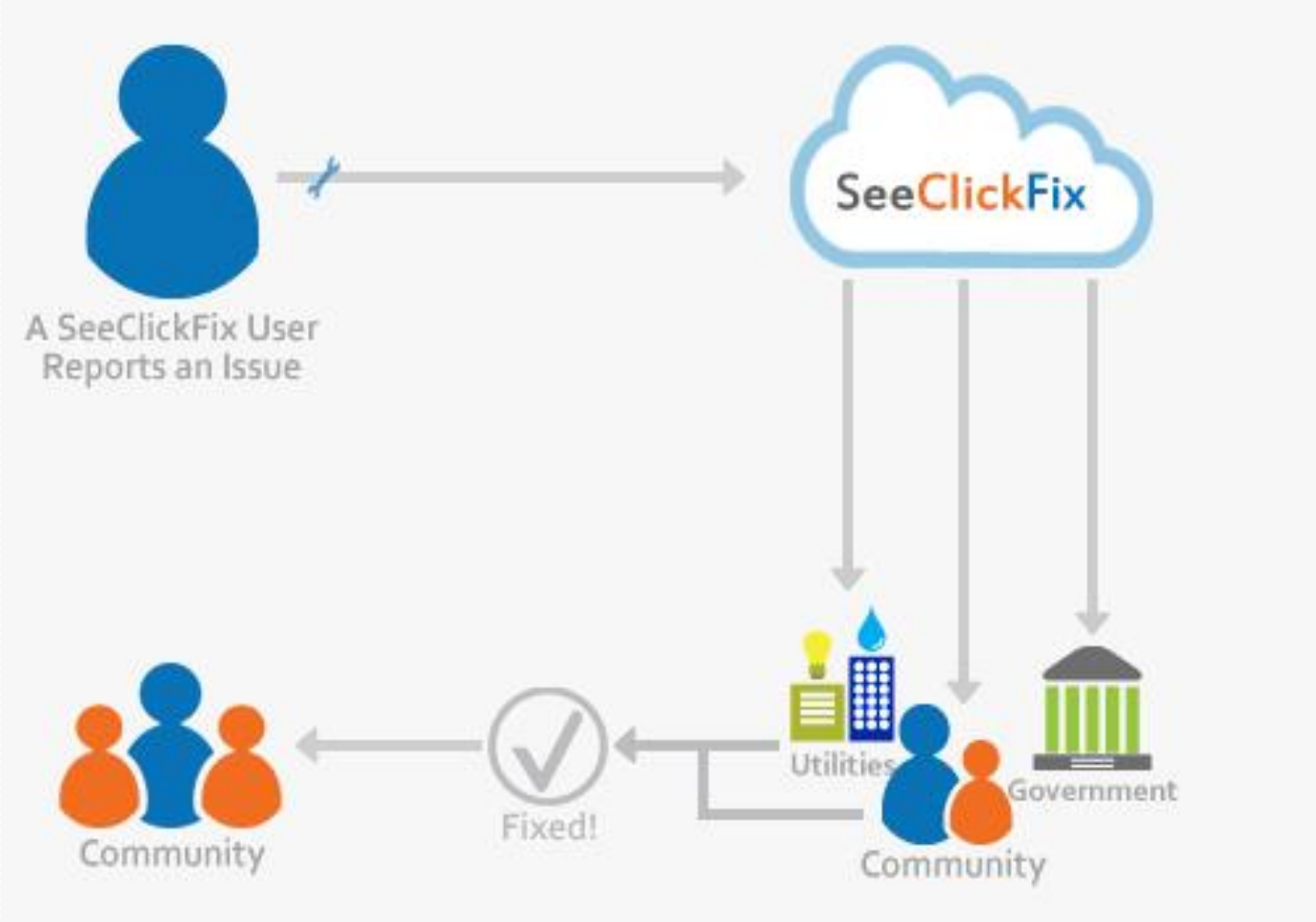
Reason for Participating

- Professional
- Personal
- Contributing to issuance of quality patents
- Other
- Contribute to patent reform
- Exploring subject matter
- Participate in community of practice
- Develop professional reputation

Source: Peer-to-Patent Second Anniversary Report*, Center for Patent Innovations at New York Law School, 2009*

Example: SeeClickFix

- Allows people to report non-emergency problems in local community via
  - SeeClickFix web site
  - Free mobile phone app
- Problems reported include
  - Potholes
  - Graffiti
  - Malfunctioning traffic signals
  - Obstructed wheelchair access ramps on sidewalks
  - Other issues of public safety & disrepair



- Provides useful info gathering mechanism to
  - Better understand issues facing a community
  - Better allocate resources to fix the problems

Broadcast Search Approach

Examples

Overview

- Useful when an empirically right answer exists & knowledge of a single expert (or handful of experts) somewhere in the community is needed to know the answer
- Organization tasks crowd to solve problem
  - Akin to casting a wide net to find the one needle in the haystack
- Ideal for ideation problems with empirically provable solutions e.g., scientific problems

Crowd-sourcing Innovation (CSI)

- An open innovation model where problems/challenges are being posted, & solutions provided by a large community of unrelated “solvers” through Internet

- Key Characteristics
  - Business & technical problems by “seekers”
  - Divide large problems into smaller ones if needed
  - Large network of problem “solvers”
  - Leverage heavily on digital/social media & syndication channels

CSI Steps

1. Seekers posts challenges & problems on website along with an appropriate award
2. Solvers submit solutions to challenge
3. Seeker pays an award to Solver who best meets solution requirements as outlined in challenge
4. Seeker owns chosen solution

Features of CSI

- A Flexible Challenge-Driven Innovation Model
  - Public Challenge
  - Private Challenge
  - Grand Challenge
  - Partner Challenge
  - Used by corporate, government, non-profits etc.
- Ideas & solutions at lower cost, in shorter time, & with less risk
  - Access to diverse, global talent both inside & outside
  - Pay only for results

InnoCentive

- InnoCentive uses crowd-sourcing as alternative to traditional, in-house, corporate R&D model
  - 250,000 “solvers” -- independent scientists from 200 countries
  - Many not experts in particular disciplinary domain, nor professional scientists
  - Crack some of most vexing complex problems that even top corporate R&D minds cannot solve
- “Seekers” include Boeing, DuPont, Proctor & Gamble – whenever problems stump their in-house scientists
- Winning solutions are rewarded & owned by companies who sought solutions in first place

InnoCentive: 2001 - 2011

- **Total Solver Reach:** More than 12M through strategic partners
- **Total Challenges Posted to InnoCentive.com:** 1,320
- **Project Rooms Opened to Date:** 374,862
- **Total Solution Submissions:** 27,657
- **Total Awards Given:** 1,015
- **Total Award Dollars Posted:** > $28M
- **Range of awards:** $5,000 to $1M based on complexity of problem
- **Average Success Rate:** 50%

Peer-Vetted Creative Production Approach

Examples

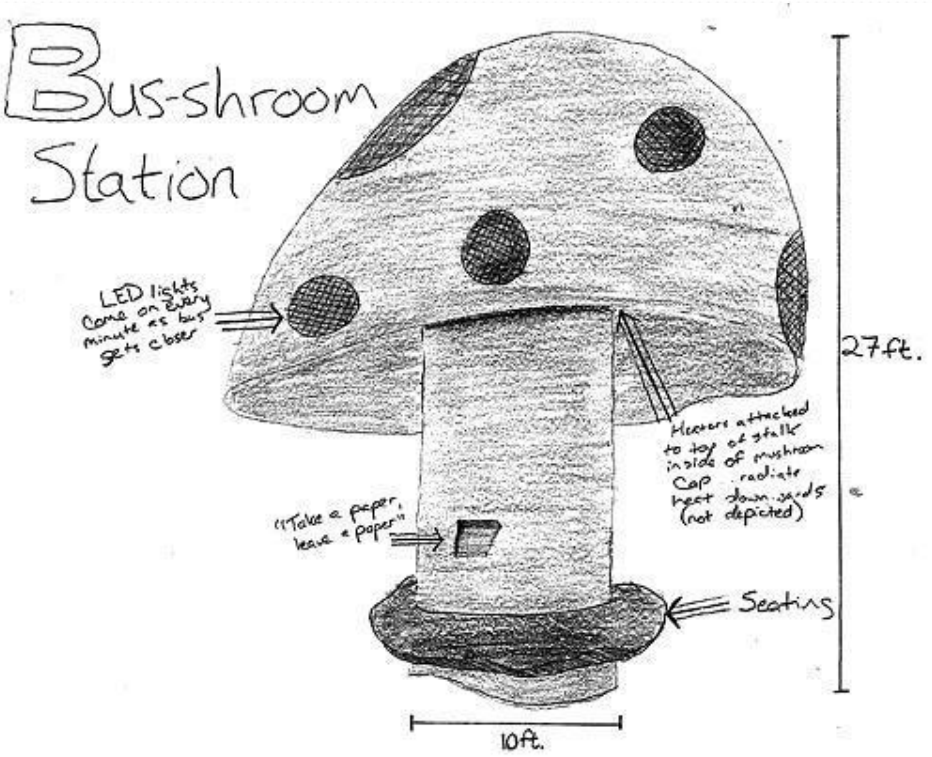
Overview

- Useful when there is no empirically right answer, but rather "right" answer that market will support
  - "Right" answer is a matter of consumer tastes or user preferences
- Approach can help to generate & vet original ideas to find a best choice
  - Assumes "good" solution is also popular solution that market will support
- Opens up creative phase of a designed product to vast network of Internet users
  - Some superior ideas will exist among flood of submissions
- Suitable when taste & user preferences matter

Salt Lake City – NextStopDesign

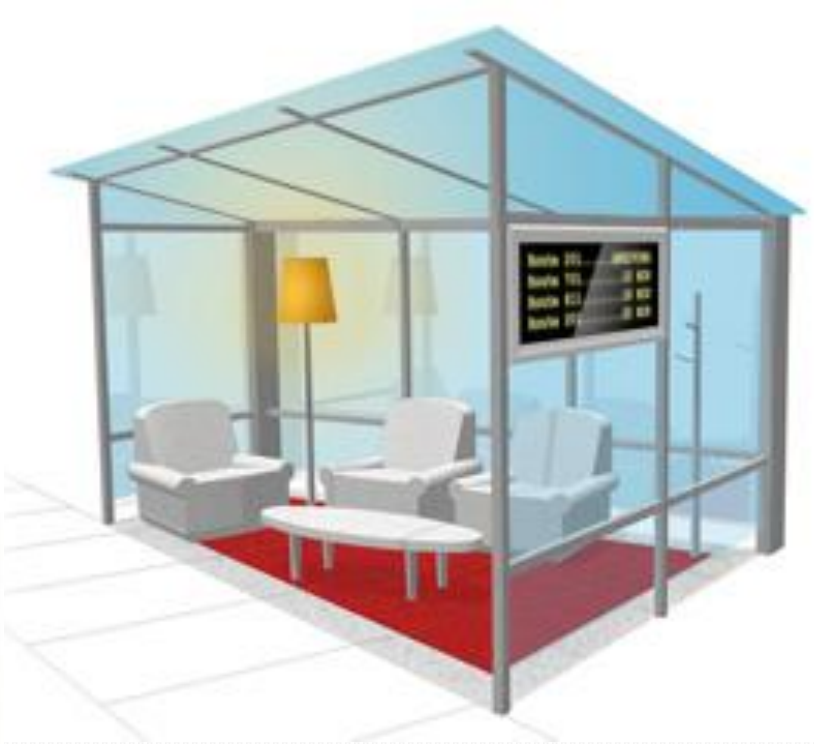
- Domain: Urban planning
  - PhD dissertation project for Daren Brabham
  - $110K grant from Federal Transit Administration
- Solicited innovative design to design problem from around the world
  - Online design competition for a bus stop in Utah
- Steps
  - Anonymous users post 1 - 3 images of proposed designs on site
  - Other registered anonymous users rank said designs on a scale of 1 - 5 stars
  - When voting ends, highest rated design “wins”

Sample Entries



- Designer: Tony Umpierre (Salt Lake City)
- Cap of mushroom has radiating heaters that turn on at 40 degrees F
- Multi-coloured LED lights flash when a bus is 5-min away
- Has "take a paper, leave a paper" system - Passengers leave newspapers for each other to read.

Sample Entries



2009

identify

Identify natural sites within Utah that display a wide variety of boulder types.
Boulders are re-appropriated for use as shelter.

1

acquire

Detonate loose boulders to capture representative range including sandstone, red rocks, and other sedimentary and metamorphic rock.

2

transport

Truck boulders onto University of Utah campus.

3

install

Lower pre-drilled boulders onto steel supporting tubes. Each tube is 4" in diameter and can support approximately 250 lbs/sq ft.

4

NextStopDesign – Bitter after-taste?

- Being highly rated depends on how others rank you
  - In each own interest to vote everyone else as low as possible to jockey for a higher position
- Cut-throat environment where everyone leaves absurdly irrelevant and overly harsh criticisms on other designs
  - Depresses entire vote score
  - Out of around 200 designs , median score is 1.6 out of 5
  - Highest ranked design is the one has garnered most goodwill among a loose network of users
  - Comments & ratings are anonymous
    - Difficult to trust

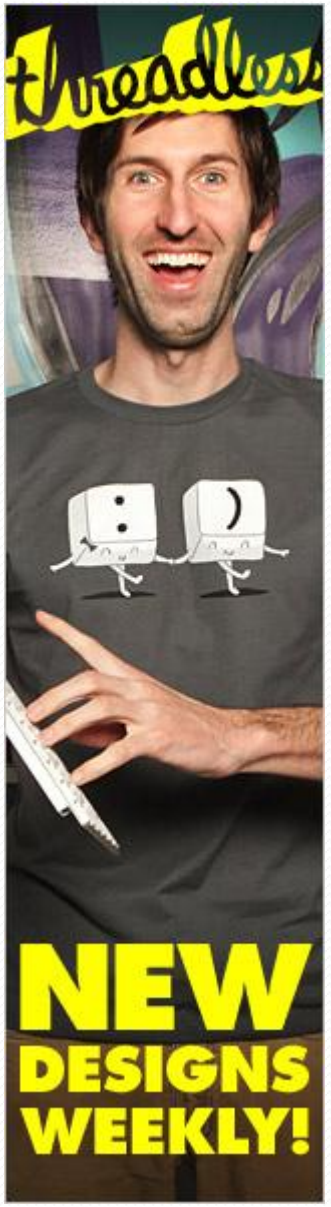
Example

- Threadless.com
  - Designs are created by & chosen by online community
  - eCommerce site that sells silk-screen T-shirts & sweatshirts based on designs submitted & chosen by registered users
- Each week, about 1,000 designs submitted online & put to a public vote
- After 7 days, staff reviews top-scoring designs
- Based on average score & community feedback, about 10 designs are selected each week, printed on clothing & other products, & sold worldwide through online store & at retail store in Chicago

Threadless Designs

Threadless Rewards (1/2)

- Designers whose work is printed
  - Receive $2,000 in cash
  - $500 in Threadless gift cards
    - Can be exchanged for $200 cash
  - Each time a design is reprinted, artist receives $500 cash
- Threadless keeps rights to design on clothing
- Designers keep rights to their designs on all other media



Threadless Rewards (2/2)

- As of June 2006
  - Has less than 20 employees
  - Sold 60,000 T-shirts per month
  - Profit margin of 35%
  - Year gross revenue of $18M

- Profitable method
  - Market research is integrated with production cycle
  - Risk & overheads are greatly reduced
  - Engages a captive audience thru out process

Threadless Artists

- Aled Lewis (UK) started submitting in 2006
  - Has been paid $56,200
  - Has had 20 designs printed

- Kneil Melicano (Philippines) started submitting in 2007
  - Has been paid $41,700
  - Has had 11 printed designs

Distributed Human Intelligence Tasking

Examples

Overview

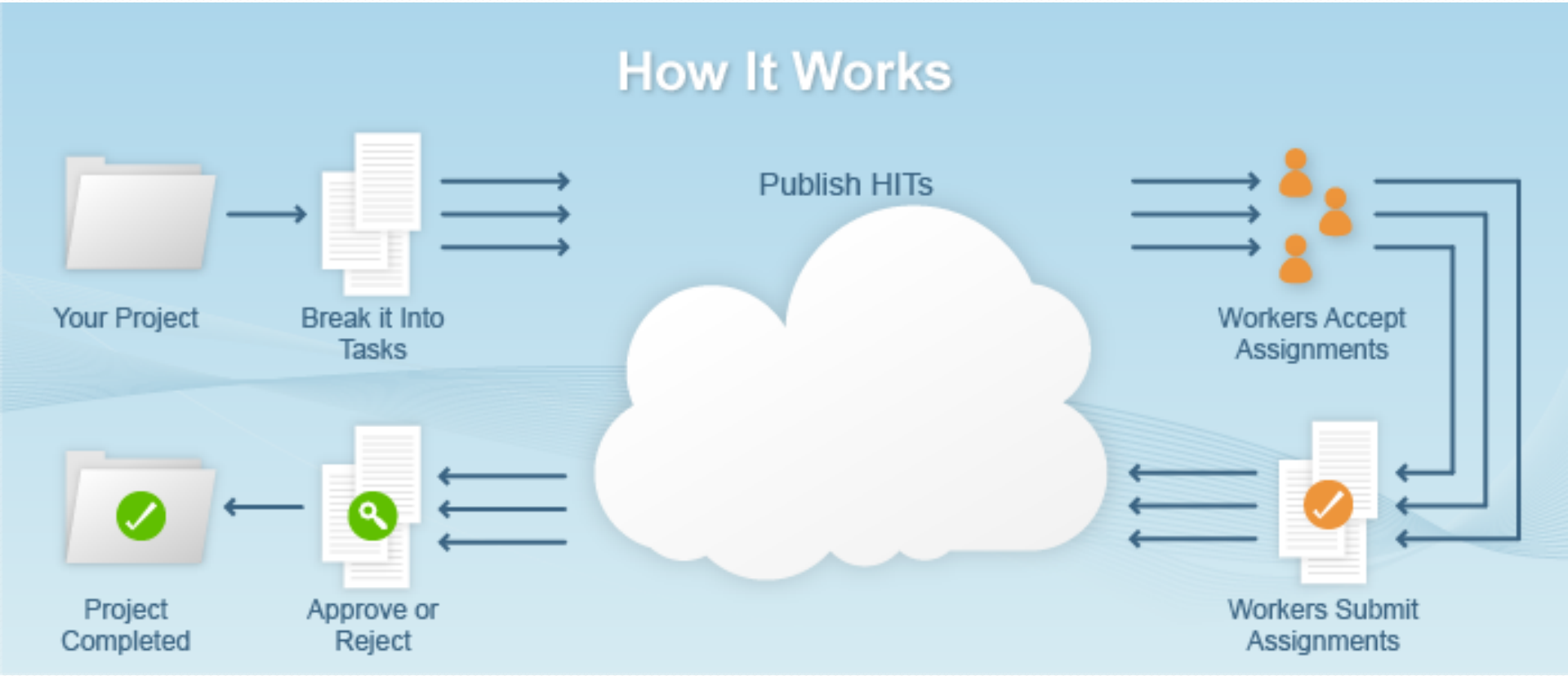
- Useful when online communities are needed to perform tasks that require human intelligence, in order to process large batches of data or info
  - Problem is not to produce designs, find info or develop solutions
  - Least creative & intellectually demanding
    - Motivation for participation is monetary compensation
- Need massive amounts of micro-labour to crunch large piles of info in systematic ways
  - Suitable where computers are incapable of performing
    - Counter-example: SETI@home
  - Example: Amazon Mechanical Turk (mturk.com)

Example: Amazon Mechanical Turk

- Coordinates large-scale collections of simple tasks requiring human intelligence
- "Requesters" can use site to coordinate a series of simple tasks they need to accomplished by humans
  - E.g., Accurate tagging of contents of images on Internet for a search engine
- "Turkers"
  - Individuals in Mechanical Turk community
  - Sign up to accomplish "human intelligence tasks" (HITs)
  - Paid very small monetary rewards by Requester

amazon mechanical turk™

Artificial Artificial Intelligence



amazon mechanical turk™

Artificial Artificial Intelligence

Get Results
from Mechanical Turk Workers

Ask workers to complete HITs - *Human Intelligence Tasks* - and get results using Mechanical Turk. Register Now

As a Mechanical Turk Requester you:

- Have access to a global, on-demand, 24 x 7 workforce
- Get thousands of HITs completed in minutes
- Pay only when you're satisfied with the results

Get Started

Challenges in adopting crowdsourcing for eGovernment

Critical Success Factors (1/2)

- A robust, active & motivated crowd
  - No coherent set of best practices to build & sustain online communities
  - Understanding of fickle online communities is still undeveloped
- A great deal of transparency & trust on part of organization
  - Must specify parameters of a given problem
    - May have to expose proprietary data, inner working, weakness
    - Must be willing to let online community become stakeholder

Critical Success Factors (2/2)

- Ensuring "of the people, by the people"
  - Can be manipulated & gamed (like other aspect of participatory culture)
  - Can be flood with fraudulent votes or phony accounts
- Representativeness
  - Internet access is lower among economically disadvantaged, racial, & ethnic minorities
  - Hard to claim a design win is what is wanted by all

Exploitation (1/2)

- Next Stop Design
  - “What you win is completely undefined, but hidden deep in the bowels of the site is the statement that NextStopDesign will present the portions of the highest rated designs as possible qualities the Utah Planning Division could consider implementing in the future. In this scenario NextStopDesign acts an unnecessary parasitic gatekeeper.”
- Prize money earned in Threadless & InnoCentive is relatively small
  - Successful Solvers likely to reap enormous profits for Seekers that secure IPR to invention

Exploitation (2/2)

- Other comments
  - People deserve rights, ethical treatment & fair pay
  - Can crowds organize against unfair labor practices?
    - No unions or professional ethical codes, no official associations to define standards, no formal arrangement to discuss equity in pay or IP rights over ideas
- Any crowdsourcing application is only as vibrant as its online community
  - Crowd is free to leave if dissatisfied
  - A large enough exodus can cause a crowdsourcing application to collapse
- Organization can counter crowd organizing themselves by
  - Not including a discussion forum
  - Imposing policy choices e.g., terms of use restrictions

Amateurism

- Crowd of amateurs (or hobbyists) in crowdsourcing
  - Condescension evident in use of "enthusiastic" or "eager" to describe amateurs
  - *New York Times* article (28 Dec 2010)
    - Crowdsourcing transcription of handwritten archival texts "can be difficult for the pajama-wearing amateur"
  - Crowdsourcing work dismissed in its importance, impact or expertise
  - De-legitimize & belittle abilities of amateurs
- Empirical research shows that crowds are largely self-selected professionals & experts who opt-in to contribute
- "Starving Artist" image
  - Scapegoats amateurs as the reason artists suffer
  - Amateurs disrupt the status quo of enterprise

Perceived Threats

- A threat to ability of professionals to control a market & make money
  - Pose threats to bottom line, driving down industry prices
  - Professional photographer Russell Kord on iStockphoto
    - "digital cameras have taken away the skills necessary to expose a decent image, composition is a matter of opinion, and distribution is now cheap and easy"
  - *Diagnostic Imaging* trade magazine
    - "When low bids win, radiologists lose out; new business models threaten to snatch rights under your nose"
  - *Advertising Age* (12 July 2010)
    - "Crowdsourcing's democracy loses some appeal when your rate card is in jeopardy"
- An unwelcome impending paradigm shift in professional world, with creative professionals most perturbed
  - Extension of race to bottom already happening in creative industries

Democratization

- A common buzzword associated with Web 2.0
- Makes us feel like we are part of something big & collective
  - As if we are co-creating a bold future alongside government
  - Seems OK if we are not target by profit-hungry companies

Who to Blame

- Organisation never lose with outsourcing
  - All failure can be pinned on backs of the crowd
  - Organisations outsource responsibility to the crowd & avoid accountability
  - In a crowd-made failure, organisation can win with PR claiming it engaged users in more intimate ways than it ever had before

Guest speaker

Mr. Gene Tan

Director, National Library Office
Programme Director, Singapore Memory Project
NLB