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***Overview***

This paper describes and proposes to apply techniques associated with the phenomenon of crowd-sourcing to training contexts of the Community Learning System.

***Research***

The Premise: Crowd-sourcing micro-tasks in human computing will be an increasingly important feature of work life so how can this strategy be productively included in a training context?

As the desktop, the evening news, fiction and social interactions have all become more fragmented or de-contextualized this research will ask:

- HOW are knowledge workers and the way they train likely to change?
- HOW will crowd-sourcing as a workplace paradigm affect training?
- HOW can a Community Learning System be enhanced by this strategy?
- WHAT aspects of crowd-sourcing should be avoided?

**Methods**

To understand these questions better I thought about knowledge workers and how they have been educated. I also thought about piece workers' work life and training patterns. I looked at a range of businesses that are using this paradigm and at the technical and social underpinnings of its use. A significant source of insight was drawn from discussion

with colleagues in a seminar concerned with designing e-learning. The discussion took the form of a thought experiment, that is, I crowd-sourced the idea of building a training company called "Blue Sky Training".

### The Crowdsourcing Process

*In Eight Steps*



Image by Daren C. Brabham | [www.darenbrabham.com](http://www.darenbrabham.com)

## Definitions

Community Learning System [CLS] A model that integrates personal learning environment with socially networked learning management.

Crowd-sourcing uses a networked group of people to test ideas and answer questions or to accomplish micro-tasks. The network doesn't have to be electronic or even be aware of itself as a community. The exchange isn't always monetized, depending on the system participants sometimes get points, shares or are incented by being offered more prominent or paid roles based on participation.

Knowledge Worker is a person who works in the "white collar" service sector with information as either a work product or a tool or both and is usually paid a salary.

Piece Worker is a person who works in the "blue collar" manufacturing sector and whether in a factory or their own home is paid by the item for objects produced.

Synthesis higher order thinking or learning that involves comparison....[Piskurich, 2010]

Thought Experiment<sup>1</sup> or mental experiment is the practice of imagining the steps that would be taken in a physical test. It is used when it is difficult or impossible to test the hypothesis in physical time and space, for example, if the components involved are very large (the Universe) or very small (subatomic). Or it can be a kind of rehearsal to test assumptions prior to conducting an experiment physically.

### **Sources And Examples**

Two prominent examples of use of crowd-sourcing interactions are in IRC, or Internet Relay Chat and in the SETI @ Home project.

IRC,<sup>2</sup> an early ancestor of Instant Messaging, uses IP address tunneling to connect people in real time. Most of the people were developers or programmers connected through channels of common interest and only coincidentally co-located geographically. Because of the speed of communications and levels of investment in problem solving a question put out on a channel might be offered several rapid, relevant answers. The direct benefit to contributors was increased credibility with many indirect benefits such as being invited to participate in the next sexy atartup company. The power in these exchanges energized the channels and arguably lead to much of the dynamic growth in the internet over its life time, erasing boundaries between private and public sector and connecting university researchers with business environments.

SETI@Home is the project that since 2002 has connected arrays of radio telescopes scanning the universe for signals of intelligent life with computers all over the world through the internet. In contrast with IRC, SETI made use of connectivity to leverage the processing power of otherwise idle computers. SETI too operated on a volume basis but was not at all interested in human interactions with the vast amounts of data that needed to be processed checking for patterns associated with intelligence coming from the depths of space.



***Lovell Radio Telescope, Manchester, UK.***

These examples illustrate the range of microtransactions that can be harnessed in community contexts and that the source of their power is in volume. Communities connected by high speed networks offer an advantage [Kennedy, 2000]. No one individual provides all the intelligence needed to answer a complex question but a high speed network allows a solution set to emerge. This is the same Connectivism [Bandura, 1996] at work that's recognizable in clan hunting or irrigation projects or a whole village raising a child but amplified by the electronic context. First Yahoo then Google have exploited this power in volume-based advertising to such a lucrative extent that all their other services could be "free". The more players that can be induced to run their transactions, social and otherwise, through these vast systems the smarter the systems become.

The variety of opportunities to participate in crowdsourcing has proliferated as the ability to mine the data for emergent patterns has grown. The current landscape is characterized by many more active and self-conscious communities.

Chaordix [See Resources, Appendix B] operates as a clearinghouse for innovation through crowdsourcing. Their online directory are dozens of different companies that apply the crowdsourcing as a core component of their business model. There are many dozens more opportunities on offer for individuals to participate in a crowd or to bring their community intelligence to bear on creative problems ranging from the City of Austin's website to the Picnic Green Challenge ideas to save the planet to the peer-produced encyclopaedia, Wikipedia.

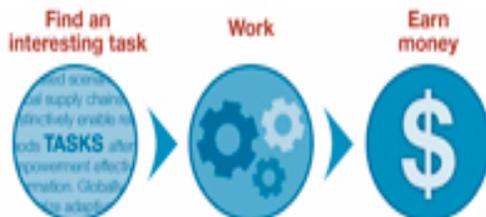
Though they may use different language all the various venues for this type of work share the objective of realizing what Amazon first called Human Intelligence Tasks [HITs]. [See Appendix B, Resources] Mechanical Turk was one of the earliest entities to build a toolkit to monetize microtasks.

## Make Money by working on HITs

HITs - Human Intelligence Tasks - are individual tasks that you work on. [Find HITs now.](#)

As a Mechanical Turk Worker you:

- Can work from home
- Choose your own work hours
- Get paid for doing good work



## 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



**Amazon's Mechanical Turk lays out benefits for workers and employers.**

They had an idea similar to SETI@home, use surplus computing power for a simple repetitive task, running an algorithm against the large data output from radio telescope arrays to look for a specific signature. Only with MechanicalTurk the unused computing power was identified as being within human knowledge workers. Tasks that humans do so quickly we take for granted like translation, face recognition or image categorization are very difficult for computers to accomplish at all, let alone quickly.

Further, knowledge workers are trained in synthetic thinking but 1) their salaried positions don't take up all their time and attention 2) they may experience higher levels of workplace churn giving them periods of flexible or entirely free (and unpaid) time. Most importantly from the crowd-sourcing employer's point of view, these workers are already trained, requiring no more investment than straight pay for tasks completed. Also any intellectual capital generated is, by contract, owned by the network not the individual.

### Results & Analysis

Since the Mechanical Turk was released there have been three distinct directions to emerge that all make use of the same underlying technology but apply it to serve different goals, The Altruistic, the Closed Circuit and the Mission-Driven.

- **The Altruistic**

A community contracts its expertise in human processing tasks to benefit the larger community. The best example of this is the Extraordinaires [See Resources, Appendix B]



The Extraordinaries' call for micro-volunteerism aims to leverage the human computing power in communities that already exist. This Impressionist image from the Smithsonian is both an advertisement of a particular cataloging project and of the image of enhancing one's personal network through engagement. The marketing is masterful. The implied question: "Are you bored with your fashionable life?" is both an ego stroke and a jab, a call-to-action that is followed up by clear options for getting involved. The tasks on offer are concise and game-like but in volume add up to something bigger than backgammon. Its possible that these activities could fulfill the role of game-playing in a social setting by giving people who want to be together something to do. This is a relatively new venture. If this feedback loop can be activated The Extraordinaries could be bigger than Facebook. The potential applications of The Altruistic model for supporting crowd-sourced training within a Community Learning System are broad as demonstrated by the Extraordinaries effort. Since no money changes hands the compensation is all implicit: credibility, even notoriety may be factors but primarily the joy of working on something for its own sake and pride in accomplishing something.

**WHAT CAN YOU DO WITH YOUR CROWD?**

- Turn Conference or Event Tweets into a Useful Set of Notes.**  
Take tweets from people around you and transform them into a valuable summary.  
**Tweet Notes**  
Collect and Organize Notes
- Pinpoint Custom Locations on Your Own Google Map.**  
Team up with your community to mark resources, unique locations, and more.  
**Crowd Maps**  
Map Custom Places
- Vote For The Top Resources, Websites Places, and More.**  
Use the smarts of your crowd to identify the Top Ten best options.  
**Top Ten**  
Rank Top Resources
- Launch a Photography Competition to Harness Community Talent.**  
Tap the creativity of your community through fun and friendly competition.  
**Creative Contest**  
Harness Crowd Creativity
- Turn Folders of Images into a Powerful Library.**  
Use the eyes of your supporters to add descriptive keywords to your images.  
**Image Library**  
Create Searchable Archives
- Don't See Something? We Can Help! Contact Us Today.**  
Fill out a quick form and we'll be in touch!  
**Custom Requests**  
Harness Your Crowd

### ○ **The Closed Circuit**

Variation on the theme of the company intranet, social tools and learning are applied to benefit the knowledge base of the workers of the company who are all paid to work at their jobs in the more traditional sense. In this case crowd-sourcing of tasks doesn't exploit an underemployed work force. Kaiser Permanente [Salem, 2010] and the Exploratorium [Reed, 2010] both use this strategy to give knowledge workers a channel to leverage each others' expertise outside of conventional teamwork.

At the Exploratorium, the famous hands-on science museum, the workers are generating a tag cloud associated with project ideas which is broadcast in real time through their main communication channel, an intranet. At Kaiser employees have access to a knowledgebase of internal resources that can be activated for paid project work across teams. This has the practical effect of saving money and time in hiring externally for small jobs that could be done by someone already employed but with available bandwidth. Aspects of this approach to crowd-sourcing that may be applicable to training within a CLS include the incentive structure (pay and increased visibility) and the power that comes from working within a trusted system.

### ○ **The Mission-driven**

A community is expressly formed to serve a particular mission and employs crowd-sourcing to accomplish it. Live Mocha Language Learning Community (See Resources, Appendix B) exemplifies this approach. The image below shows some of their crowd-sourced learning strategies: Submissions of sample sentences are made, reviewed by the 'crowd' and rated. These strategies have direct application in a CLS.

The screenshot shows the 'Review Submissions' page on the Live Mocha website. The page has a dark brown header with navigation tabs for 'Home', 'Learn', 'Share', and 'Teach'. Below the header, there's a 'Review Submissions' button and a user profile icon. The main content area is titled 'Review Submissions' and includes a brief explanation of the review process. It features a filter section for 'Exercise Type' (All, Write, Speak) and 'Show Me' (English). Below this, there are two submission cards. The first card is for 'Role Play' submitted by 'morcivert57', with an average rating of 4 stars and 1 comment. The second card is for 'Describe your clothes' submitted by 'OMAR68', with 0 comments. On the right side, there's a sidebar with the text 'Reclaim your brain' and a 'Play' button.

## **Recommendations**

The Altruistic, Closed Circuit and Mission-driven approaches to crowd-sourcing each offer valuable methods to address training needs within a CLS. Because it is a relatively

new phenomenon continued observation through participation in these channels is worthwhile. Risks that have emerged from this survey would be: One, in relying too heavily upon crowd-sourcing as a learning strategy at the expense of balance toward other methods; Two, failing in editorial oversight so that inaccuracies propagate and persist in the community. Because the reinforcement is immediate, motivation to participate will probably be the area where most measurable results will occur. [Maldonado, et al, 2009]

### **Conclusion**

Crowd-sourcing as a stand-alone activity is unlikely to produce desirable performance outcomes and used in isolation may in a training context contribute to alienation, and reducing motivation without significant increases in shared meaning. However when integrated into the context of a learning community with the supports and linkages derived from the culture of a wholistic system crowd-sourcing may contribute significantly to transactional immediacy. A more responsive environment encourages greater participation, dynamism and meaning which all contribute to more effective learning.

### **Appendix A: Transcript Discussion of "Blue Sky Training" ITEC 865 seminar**

*KRA: Now that we've looked at an overview of crowd-sourcing, I'd like to invite you to participate in a thought experiment with me tonight. What if we were to build a company around crowd-sourced training? What could a training interface do to encourage learners to work through it? What feedback loops could we place and where?*

**Alisha Klatt: is there a way to foster discussions that would pull in people's own trusted sources from their own social networks?**

*KRA: Has anyone [in this group] already been working in this fashion?*

**Chris Salem: Not with Mechanical Turk but Kaiser has an internal tool, a classified system or database of resources you can go in and search for people or register yourself as a resource...they are compensated in actual pay, overtime. Not collaborative but small jobs.**

**Ian Pollock: There's a language website called Life Mocha where you can pay to speak with a native speaker or exchange working as a conversation partner in one language to learn with a partner in another. So there's value**

**added for a task you might not want to do. Its different from output based learning, its about the interaction.**

**Arl: What about adding context-specificity? Say you do this for a company and you have people who are trusted but they also understand the context. For example you have a slaesperson going to a new country if they can work with someone who's actually from that area and has direct knowledge of it. You can get help on YouTube but it may not be directly related to what you're actually doing.**

**Chris Salem: What about integrating it into usability testing rather than training? Open call for comments.**

*KRA: These do exist as more informal exchanges, if you particpate others are willing to help you.*

**Lom: I'd like to clarify what your paper is about. There's a phenomena already happening of online communities helping each other?**

*KRA: It's a phenomenon of individuals selling their time to work on micro-tasks. This thought experiment is a way of thinking about how we as instructional designers would design training for this way of working, to contrast it with the way we currently create training. We now think in bigger pieces. For university with accreditation. How do you validate someone's experience as having been trained? What makes someone certifiable? Who is an expert?*

**Lom: Is your service for designers? Who is the target audience?**

*KRA: I introduced this idea to examine how training can be created for de-contextualized work and what value it could have for workers.*

**Kelly Reed: I'm not sure what this Mechanical Turk is or does.**

*KRA: Ok I'll take that as a note to pay more attention to definition of terms. Mechanical Turk is a web app that Amazon.com developed to monetize microtasks. Examples: Write a book review and get paid for it. Review the reviews. It's a volume based model.*

**Lom: If people are already doing work like this for free why would they get paid for it? Why would Amazon invest thousands in something that people are doing fr free?**

**Ian: You might be surprised how much of what you see that you think is free is actually paid for. There are people who are professional twitterers. There are lots of marketing services that specialize in writing & placing reviews. [Time's up!]**

*KRA: Please send me comments or lets talk further, thanks!*

### **Appendix B: Resources**

Amazon's Mechanical Turk

Available from: <https://www.mturk.com/mturk/welcome>

Chaordix, Crowdsourcing in Action [Directory]

Available from: <http://www.chaordix.com/crowdsourcing-in-action>

The Extraordinairies

Available from: <http://app.beextra.org/home/>

IRC, Internet Relay Chat

Available from: <http://www.softpedia.com/catList/38,0,3,0,2.html>

SETI@home

Available from:

[http://seticlassic.ssl.berkeley.edu/about\\_seti/about\\_seti\\_at\\_home\\_1.html](http://seticlassic.ssl.berkeley.edu/about_seti/about_seti_at_home_1.html)

### **Notes**

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<sup>1</sup> From the German word "Gedankenversuch", H.C. Orstad, 1820

<sup>2</sup> created by Jarkko Oikarinen in August 1988.

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