

CROWDSOURCING APPLICATIONS FOR PUBLIC HEALTH

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Introduction

- a framework for crowdsourcing in the domain of public health

Crowdsourcing

- ⦿ an organization communicates a problem or challenge to participants in an online community
- ⦿ Members of this community then provide solutions to the problem
 - open
 - user innovation
 - collective intelligence
 - the wisdom of crowds
 - marginality in problem solving

The Crowdsourcing Continuum

- ⦿ active user participation
- ⦿ Minimal
- ⦿ convenient
- ⦿ contributions of creative effort and analysis

The Crowdsourcing Continuum

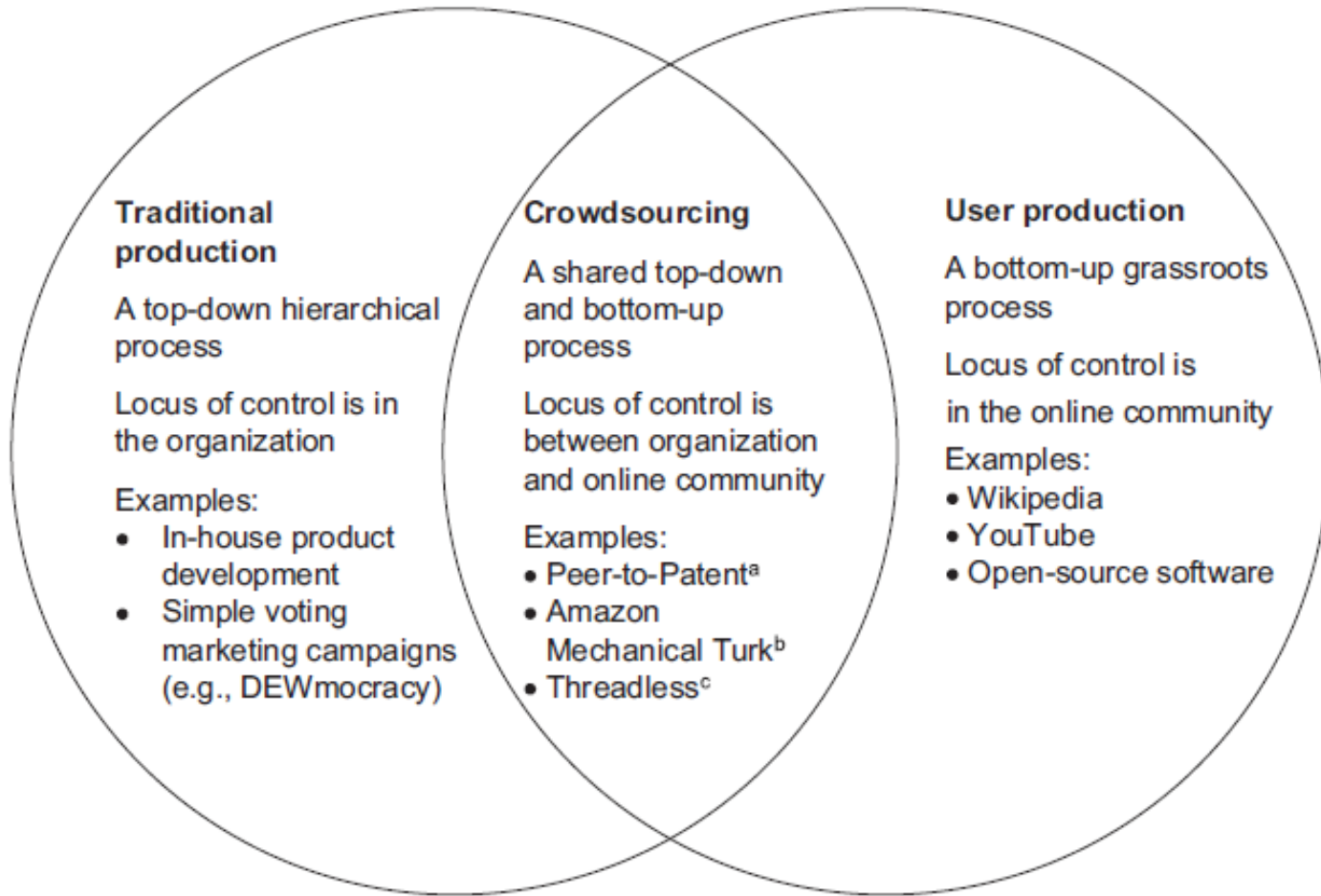


Figure 1. Crowdsourcing as a blend of traditional, top-down production and bottom-up user production

A Framework for Crowdsourcing for Public Health

- knowledge discovery and management
- distributed human intelligence tasking
- broadcast search
- peer-vetted creative production types

Knowledge Discovery and Management

How it works	Organization tasks crowd with finding and collecting information into a common location and format
Kinds of problems	Ideal for information management problems involving information gathering, organization, and reporting, such as the creation of collective
Current and potential uses in public health	Identifying food deserts by gathering userreported grocery store locations on a map; reporting injury data on playgrounds and dangerous intersections; finding tobacco retailers in states without retailer licensing or conducting a “Product Watch” to report emerging tobacco products, such as dissolvables or e-cigarettes; identifying accessible scarce public health resources at the community level, such as pandemic influenza vaccine; tracking and mapping illness trends and clusters, e.g., using GermTrax.com; participatory sensing of particulate matter levels, e.g., the CitiSense platform; gathering information on the use and condition of parks and bike trails

Distributed Human Intelligence Tasking

How it works	Organization tasks crowd with analyzing large amounts of information
Kinds of problems	Ideal for information management problems involving large-scale data analysis where human intelligence is more efficient or effective than computer analysis
Current and potential uses in public health	Language translation for health campaign brochures and websites; making data entry, cataloguing, and organizing information more efficient and cost effective for health organizations; behavioral modeling for weight loss factors; disease and behavior change data registries, e.g., National Weight Control Registry

Broadcast Search

How it works	Organization tasks crowd with solving empirical problems
Kinds of problems	Ideal for ideation problems with empirically provable solutions, such as scientific problems
Current and potential uses in public health	Identifying novel solutions to sanitation in the developing world, e.g., the Bill and Melinda Gates Foundation's Reinvent the Toilet Challenge ⁴⁶ ; issuing challenge briefs for vaccines to prevent emerging diseases; designing medication bottles to prevent unintentional overdose; developing new designs for cooking and heating stoves in developing nations that produce little or no particulate matter; developing algorithms for predicting disease outbreaks and remedial measures

Peer-Vetted Creative Production

How it works	Organization tasks crowd with creating and selecting creative ideas
Kinds of problems	Ideal for ideation problems where solutions are matters of taste or market support, such as design or aesthetic Problems
Current and potential uses in public health	Getting community input on where to locate a park or community recreation center; adding bike lanes to city streets to promote active transit; developing social marketing campaign themes or target messages; developing menus and policies for school lunch programs; designing and determining optimal siting for community gardens and farmer's markets

Limitations and Conclusion

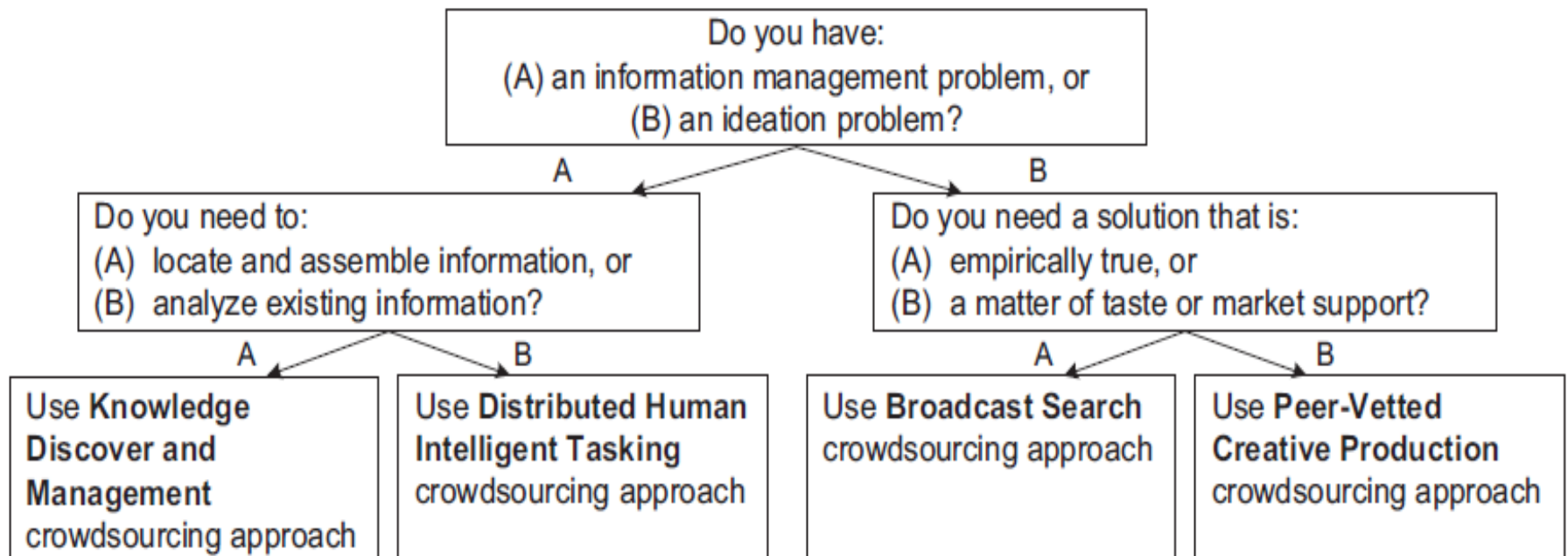


Figure 2. Decision tree for determining suitable crowdsourcing type based on problem

Future Work

- campaigns using crowdsourcing to interview users in such a way online