The Organization of Distributed Problem-Solving for Innovation:
Commonalities and Differences Among the OII-MTI Case Studies

Paul A. David
OII, The University of Oxford & Stanford University
Invited Forum, Said Business School, 1 February 2008
Focus of the OII-MTI project: the organization and performance of “DPSN’s”

What do they do?

They address a certain class of human problem: “knowledge-problems”,

To solve them requires acquiring information that is otherwise not available.

The goal is eventually to use the new information to extend and enhance those human capabilities that we refer to as “knowledge”.
A quick look at the abstract ‘conceptual space’ in which we can locate the particular concrete cases that this Project has been studying:

**Three basic dimensions to examine:**

- the problem’s characteristics
- structural features of the DPS organization
- properties of the solution-process
  — including the effectiveness of its performance
**Problem attributes** – elements of a typology describing the “tractability” of problems for distribution approaches to solutions

- **Partitionable?** – integral vs **multi-part**
- **Decomposable?** – separable vs non-decomposable
- **Granularity?** – **fine grain** vs lumpy sub-tasks
- **Sub-task solution methods?** – **known** vs unknown
- **Error tolerance for answers?** – low vs substantial
- **Relative duration of solution cycles?** – fast vs slow
- **Recurrence of problem form** – frequent vs rare
**Shared structural features of our DPSO cases:**

- participants are **not continuously co-located**
- coordination is **IT-network supported**
- key interactions are of **large-group** type
- contributors are **not employees** of the DSPO
- coordination is **not centrally planned/managed**
- new information is **produced by one or more** of three procedures:
  - aggregation
  - permutation and recombination
  - cumulative incremental elaboration
Differentiating structural features of the cases

Self-governed collaborations [B&R Group III]:
- CERN’s-ATLAS designing its architecture
- Mozilla fixing bugs in its Firefox browser
- “Simple Wikipedia” controlling the standard of readability
- “A Swarm of Angels” making an open content movies

Governed by intermediary platform-provider

One-sided platforms : [B&R Group II]:
- Information Aggregators: Digg’s News, etc.
- Prediction Markets: [B&R Group I]:

Two-sided platforms: [B&R Group I]:
- Sermo -- Broadcast search (prize is peer esteem)
- Seriosity’s Attent Game – Organization members gain attention
- InnoCentive – Broadcast search for inventions –cash prize
Dimensions of problem-resolution processes:

<table>
<thead>
<tr>
<th>PROCESS TYPE:</th>
<th>Information Aggregators</th>
<th>Prediction Markets</th>
<th>Broadcast Search</th>
<th>Collaborative Peer-production</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Collectivity or Community</th>
<th>Passive</th>
<th>Passive</th>
<th>Competitive Associative</th>
<th>Cooperative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared Purpose</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Info Controls</td>
<td>Central</td>
<td>Central</td>
<td>Central</td>
<td>Central</td>
</tr>
<tr>
<td>Governance Modality</td>
<td>Exit</td>
<td>Exit</td>
<td>Exit</td>
<td>Exit</td>
</tr>
<tr>
<td>Cycle Durations</td>
<td>v.short</td>
<td>varied to long</td>
<td>short moderate</td>
<td>short</td>
</tr>
<tr>
<td>Durations</td>
<td>to long</td>
<td></td>
<td>varied to very long</td>
<td></td>
</tr>
</tbody>
</table>