Understanding Versus Designing Online Communities

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Premise

• Collective intelligence is more likely to emerge and be effective if the social environment is organized appropriately to solve enduring problems in many group and organizations.
Online groups face challenges typical of off-line groups

Start-up
Recruit members
Socialize newcomers
Develop commitment
Elicit contribution
Regulate behavior
Coordinate work

But anonymity, weak ties, high turnover, & lack of institutional context make challenges more daunting online

My Research Style

• Social science: Empirical research on the ways that existing online groups meet these challenges

• Engineering: Design and implementation research on ways make to make online groups more successful
Managing volunteers

• Self-direction: Volunteers work on any task they want.

• Benefits: Volunteers work on task where they have motivation & expertise
• Drawback: Volunteers’ interests may not match group’s needs
Misalignment in Wikipedia: Iron Man

Iron Man

Iron Man (Anthony Edward “Tony” Stark) is a fictional character, a superhero in the Marvel Comics universe. The character was created by writer-editor Stan Lee, developed by artist Don Heck, and designed by artist Ross Andru and John Romita Sr. Appearing in Tales of Suspense #39 (March 1963), a billionaire industrialist and weapons manufacturer, Stark suffers a severe industrial injury during a test flight of an experimental jet engine he is attempting to turn into a weapon of mass destruction. In order to save his own life, Stark creates a powered exoskeleton of high-tech ingenuity, thus gaining his first Iron Man suit. He builds the suit while hiding in a mountain retreat, and his new identity is revealed to the world at the press conference that Stark’s corporation, Stark Industries, had setup.

The Iron Man suit served as an inspiration to a new era of superhero stories, with the Iron Man character becoming one of the most popular figures in the Marvel Universe, appearing in numerous comic books, novels, and other media. The suit itself has undergone numerous iterations, with each version serving as an example of the latest technologies in uses such as weapons, flight, and combat.

Publication history

Premiere

Iron Man’s premiere was a collaboration among editor and story-editor Stan Lee, artist Herb Trimpe, and writer Jack Kirby. The story begins in 1968, with Tony Stark entering into a business partnership with his former classmate, Howard Stark. This partnership leads to the creation of Stark Industries, which becomes the basis for the Iron Man story.

16th Century Philosophy

16th century philosophy

From Wikipedia, the free encyclopedia

This article is about 16th-century Western philosophy. For other uses, see 16th-century philosophy (disambiguation).

16th-century philosophy in the Western world is generally regarded as the later part of Renaissance philosophy.

Early 16th-century philosophy is often called the High Renaissance and is considered to be the precursor to the age of Modernism. Notable philosophers from this period include Thomas More, Erasmus, and Machiavelli.

History of Western philosophy

Western philosophy

- Ancient philosophy
- Greco-Roman philosophy
- Ancient Jewish philosophy
- Rabbinic philosophy
- Christian philosophy
- Medieval philosophy
- Scholastic philosophy
- Reformation and Counter-Reformation
- Enlightenment
- Modern philosophy
- 19th-century philosophy
- 20th-century philosophy
- 21st-century philosophy
- 16th century: Western philosophy

References

Social mechanisms

- Social identity + goal setting
- Shared leadership
- Effective socialization

- Social identity aligns group goals with individual goals
• Hypothesis:
  Publicizing important community task via group goal setting will motivate volunteers who self-identify as group members

• Method:
  Natural experiment in Wikipedia

Collaborations of the Week (COTW)

Collaborations of the Week
Group goal setting mechanism: let us work on Article X together this week!
Group identification

Self-identified group members:
Those who edited the project member lists.

Non self-identified editors:
Those who edited the project member lists.

Data collection

- 618 COTWs from 2004 to 2008
- 26 projects
- On average, each project consisted of 26,553 articles and 471 members
Results

Non self-identified members
Self-identified group members

Edits per person on target articles

Pre-Collaboration      Collaboration     Post-Collaboration
Edits per person on target articles
Results

Edits per person on target articles

- Non self-identified members
- Self-identified group members

Pre-Collaboration  Collaboration  Post-Collaboration

APS is calling on its Members to support the Association’s mission to deploy the power of Wikipedia to represent scientific psychology as fully and as accurately as possible and thereby to promote the free teaching of psychology worldwide.

Use Wikipedia for Writing Assignments in Your Classroom

Your students will ensure psychological science entries are accurate and complete
Early results

- Gratifying amounts of high quality work is being done
  - 126 PhD psychologists
  - 31 psychology classes with 671 students
  - Collectively improved more than 1,000 Wikipedia and wrote over 3,000 pages of text

<table>
<thead>
<tr>
<th>Users</th>
<th>Number editing</th>
<th>Number editing articles</th>
<th>Articles edited</th>
<th>Words added</th>
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<tbody>
<tr>
<td>All</td>
<td>874</td>
<td>603</td>
<td>1079</td>
<td>826,636</td>
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<tr>
<td>PhDs</td>
<td>126</td>
<td>67</td>
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<td>Students</td>
<td>752</td>
<td>535</td>
<td>749</td>
<td>720,021</td>
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Leadership to direct volunteers

- Good leaders are important to successful groups and organizations
- Help set group direction & influence people to follow it
Leadership in online communities


Shared leadership

- Leadership is an activity, not a social role

Leadership behaviors
Persuade and influence other people to pursue a community goal
Types of leadership -

Providing Positive Feedback
Providing Negative Feedback
Directing
Socializing


Leadership type: Positive feedback

I am so impressed. This is a very fine article!
Leadership type: Negative feedback

“...there is a concern that the rationale you have provided for using this image under "fair use" may be invalid. ... If it is determined that the image does not qualify under fair use, it will be deleted within a couple of days..."

Leadership type: Direction

Hey, one of these days do you think you could take some pictures at Mission Mill? I'd like to spruce up the article but it really needs some photos. Thanks!
Leadership type: Friendly interaction

Socializing

Drop me a line on my talk page sometime, we’ll get a coffee over at Hot Rize or the new King Kocoa...

Three studies

Stage 1 • Automatically measure leadership behaviors

Stage 2 • Use 7 years’ archival data to examine the influence of leadership behaviors

Stage 3 • Conduct field experiment to examine the influence of leadership behaviors
Stage 1: Measure Shared Leadership

Machine learning models to classify four types of leadership messages
- 21 features based on domain knowledge, e.g., the frequency of the phrase “thank you for”, “you should” or “if you”.
- 500 hand-coded messages as training set, 100 messages as test set
- Four SVM classifiers
- Avg accuracy = 0.89, Avg Kappa = 0.7

Distribution of directive messages in Wikipedia

Similar patterns for the other three types of leadership behaviors
Three studies

Study 1
• Automatically measure leadership behaviors

Study 2
• Use 7 years’ archival data to examine the influence of leadership behaviors

Study 3
• Conduct field experiment to examine the influence of leadership behaviors

Results
Weekly change in number of edits

- Not receive any message
- Non-Leadership
- Positive Feedback
- Negative Feedback
- Direction
- Social Exchange
Results

Weekly change in number of edits

<table>
<thead>
<tr>
<th>Category</th>
<th>Change (%)</th>
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<tbody>
<tr>
<td>Non-Leadership</td>
<td>30%</td>
</tr>
<tr>
<td>Positive Feedback</td>
<td>50%</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td>0%</td>
</tr>
<tr>
<td>Direction</td>
<td>30%</td>
</tr>
<tr>
<td>Social Exchange</td>
<td>40%</td>
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19% **

Results

Weekly change in number of edits

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Results

Weekly change in number of edits

<table>
<thead>
<tr>
<th>Category</th>
<th>Weekly Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Leadership Positive Feedback</td>
<td>14% **</td>
</tr>
<tr>
<td>Non-Leadership Negative Feedback</td>
<td>**</td>
</tr>
<tr>
<td>Positive Feedback</td>
<td>9% **</td>
</tr>
<tr>
<td>Negative Feedback</td>
<td>**</td>
</tr>
<tr>
<td>Direction</td>
<td>**</td>
</tr>
<tr>
<td>Social Exchange</td>
<td>**</td>
</tr>
</tbody>
</table>
Results

• Effects are stronger when sender is an administrator or project leaders
Three studies

- Study 1 • Automatically measure leadership behaviors
- Study 2 • Use 7 years’ archival data to examine the effectiveness of shared leadership
- Study 3 • Random assignment field experiment confirms results

Analysis

- Send relevant message to Wikipedians creating new articles
  - Neutral
  - Positive feedback
  - Negative feedback
  - Friendly social
- Compare newcomers and established members’ response to leadership messages.
Strong Effects on Newcomers

Newcomers’ Total Number of Edits

Established Editors’ Total Number of Edits

No Effects on Established Members
Socialization

- Since appropriate interaction with formal leaders and peers shapes contributions, is it possible to select and develop leadership in online communities?

- Socialization: Process through which group members acquire the behaviors and attitudes essential to playing their roles in a group or organization

Six month socialization experiments in a tax Q&A community

- Use initial behavior in the community to identify volunteers with leadership potential
- Invite them to participate in a training/socialization experience
  - Recruit & socialize in cohort, not individually
  - with peer-to-peer feedback
  - Isolate cohort from on-going community during socialization period
  - Predictable sequence of roles
  - Structured exercises
- Evaluate effects in the community
Research process

Stage 1 – Select potential core contributors
Design and implement of ML algorithms to automatically identify potential superusers

Stage 2 – Socialization experiment
Give “candidates” good experiences to build competence and commitment (vs control condition)

Success at prediction

- Can accurately identify from 2 weeks of behavior people with “potential” -- who will become core contributors

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean # of answers in following tax season</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low potential</td>
<td>606</td>
<td>0.01 (SE=0.005)</td>
</tr>
<tr>
<td>High potential</td>
<td>283</td>
<td>2.42 (SE=.181)</td>
</tr>
</tbody>
</table>

- ~ 20% of high potentials volunteered for socialization experiences
Partial success at socialization

- People in the socialization condition participated more next text season
- Participation depended on feedback they received during socialization phase
- Quality of answers didn’t increase

Natural Science versus Engineering Approaches to Research

<table>
<thead>
<tr>
<th></th>
<th>Natural science approach</th>
<th>Engineering approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assumption</td>
<td>Online communities are natural phenomena to be understood</td>
<td>Online communities are socio-technical systems to be (partially) designed</td>
</tr>
<tr>
<td>Research Question</td>
<td>How do they operate?</td>
<td>How can we improve them?</td>
</tr>
<tr>
<td>Relation to theory</td>
<td>Community as a setting to develop and test theory</td>
<td>Theory is a tool to help design the community</td>
</tr>
<tr>
<td>Methods</td>
<td>Observation, surveys, log data and regression analysis with small numbers of variables and few interactions</td>
<td>Plus: experiments &amp; simulations with more variables and higher-order interactions</td>
</tr>
</tbody>
</table>

Engineering is harder
More Information

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Websites: www.cs.cmu.edu/~kraut

Building Successful Online Communities: Evidence-Based Social Design (MIT Press, 2012):