MEASUREMENT OF SOCIAL CAPITAL IN ENTERPRISE SOCIAL NETWORKS

IDENTIFICATION AND VISUALISATION OF GROUP METRICS
GOALS
WHAT I WANT TO ACHIEVE.

- Metric Repository
- Group-Model Approach
- Visualisation Prototype
AGENDA
THE PLAN FOR TODAY.

1. Motivation
2. Background
3. Research Approach
4. Metric Repository
5. Visualisation Prototype
6. Discussion
MOTIVATION
WHY ENTERPRISE SOCIAL NETWORKS ARE IMPORTANT.

- Everyday use!
- Increasing Adoption!
- More Data!
- Analyse!

Corporate adoption of Enterprise 2.0 technologies, %


Motivation | Background | Approach | Repository | Prototype | Discussion
Measurement of Social Capital in Enterprise Social Networks
Joschka Hüllmann

2017-03-22
“resource that actors derive from specific social structures and then use to pursue their interests”
(Baker, 1990)
Background (2/6)

The different social capital levels.

Social Capital can be conceptualised at different levels → **Collective Actors** (Borgatti et al., 1998 and Riemer, 2005)
**BACKGROUND (3/6)**

**THE EMERGED SOCIAL CAPITAL THEORIES.**

<table>
<thead>
<tr>
<th>Non-redundant contacts beyond group</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disintegrated group of diverse perspectives, skills, resources</td>
<td><strong>Maximum performance</strong></td>
<td><strong>Minimum performance</strong></td>
</tr>
<tr>
<td>Cohesive group containing only one perspective skill, resource</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Network closure within group (Burt, 2002)

External → Weak Ties → **Structural Holes** (Granovetter, 1973)

Internal → Strong Ties → **Closure** (Coleman, 1988)
BACKGROUND (4/6)

AN ENTERPRISE SOCIAL NETWORK SCREENCAP.
BACKGROUND (5/6)
ENTERPRISE SOCIAL NETWORKS DEFINED.

Features (Leonardi et al., 2013)

- Communication
  - Specific/Broadcast
- Visible
  - Communication Partners
- View messages, connections, text and files
- View content at any time by any author

Effects

- Improved Knowledge Sharing
  (Ellison et al., 2011)
- Belongingness to the organisation
  (Steinfield et al., 2011)
- Willingness to help and collaborate
  (Kuegler et al., 2015)
- Employee Performance
  (Riemer et al., 2015)
Alice says to Bob: "Hey, how are you?"
Bob says to Alice: "I am fine, thanks."
Charlie says to Alice: "I am also fine!"

- Model Relationships between Actors as graph
  - Relationships → Edges
  - Actors → Nodes

- Graph-theoretic measures can be applied!
Measurement of Social Capital in Enterprise Social Networks
Joschka Hüllmann

**APPROACH (1/2)**

FOR THE METRIC REPOSITORY AND THE PROTOTYPE.

**Metric Repository**
- Structured, general-use repository
- Sourced from the literature

**Visualisation Prototype**
- Yammer dataset (Swoop) → Calculation Backend → Webservice → Visual Dashboard (IBCS)

**Motivation**
Measurement of Social Capital in Enterprise Social Networks
Joschka Hüllmann

**Background**

**Approach**

**Repository**

**Prototype**

**Discussion**

11
2017-03-22
- Merge group members to one new node
- Re-attach edges to the new node
# COMPREHENSIVE METRIC REPOSITORY STRUCTURE

<table>
<thead>
<tr>
<th>Structure</th>
<th>Name</th>
<th>Literature</th>
<th>Type</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Text</td>
<td>Articles</td>
<td>Graph</td>
<td>Ego-Centric</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Books</td>
<td></td>
<td>Global</td>
</tr>
<tr>
<td>Description</td>
<td>Text</td>
<td>Calculation</td>
<td>Interpretation</td>
<td>Overlaps</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Formula</td>
<td>Bonding</td>
<td>Other metrics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SQL</td>
<td>Briding</td>
<td></td>
</tr>
</tbody>
</table>

**Motivation**
Measurement of Social Capital in Enterprise Social Networks
Joschka Hüllmann

**Background**

**Approach**

**Repository**

**Prototype**

**Discussion**

2017-03-22
- 63 metrics identified, reduced to **20 metrics**
- 50/50 **ego-centric** and **global** metrics
- 13 metrics indicate **Bonding** Social Capital
- 7 metrics indicate **Bridging** Social Capital, **both or none**
Density

- Smith et al. (2009), Borgatti et al. (1998), Wasserman (1994)
- Global Scope
- Number of edges compared to maximum possible edges

Calculation:

\[density = \frac{|E|}{e_{max}} = \frac{|E|}{g \times (g - 1)}\]

Interpretation:
Indicates Bonding Social Capital
(Coleman‘s closure theory)
VISUALISATION PROTOTYPE
LIVE DEMO OF VISUALISATION PROTOTYPE.
**DISCUSSION (1/2)**

LIMITATIONS AND FUTURE OUTLOOK.

### Limitations

- Less common Metrics left out
- Group Approach limits Normalisation
- Tests with other datasets recommended
- Calculation is slow on normal computers

### Future Outlook

- More Features for the Website
- Updates to the Metric Repository
- Analysis of more datasets
- Usage in practice
Discussion (2/2)

**Implications for Research and Practice.**

Starting Point for further Research & practical applications

Comparison of Results due to normalisation

**Management identifies top-performing groups**

- Consider in decision-making
- Premiums based on ranking
- Improve lesser connected groups

**Motivation**

Measurement of Social Capital in Enterprise Social Networks

Joschka Hüllmann

2017-03-22