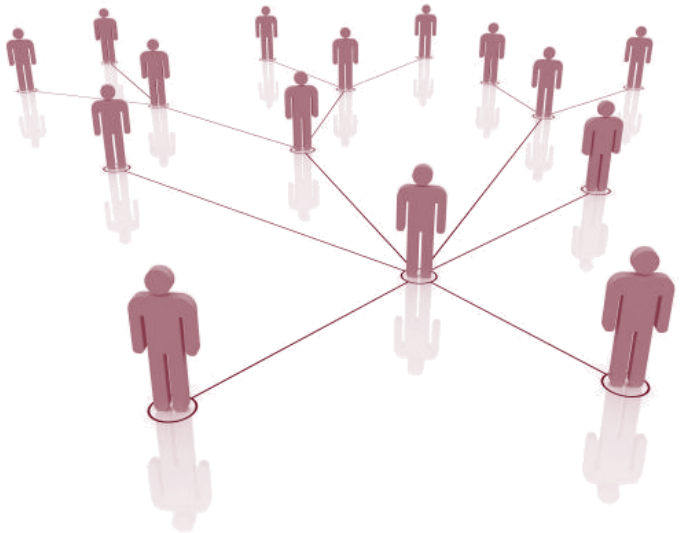
Westfälische Wilhelms-Universität Münster

ERCIS
European Research Center for Information Systems

MEASUREMENT OF SOCIAL CAPITAL IN ENTERPRISE SOCIAL NETWORKS

IDENTIFICATION AND VISUALISATION OF GROUP METRICS



The University of Sydney Business School

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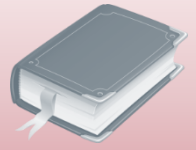
2017-03-22

GOALS

WHAT I WANT TO ACHIEVE.



Metric Repository

Group-Model Approach

Visualisation Prototype

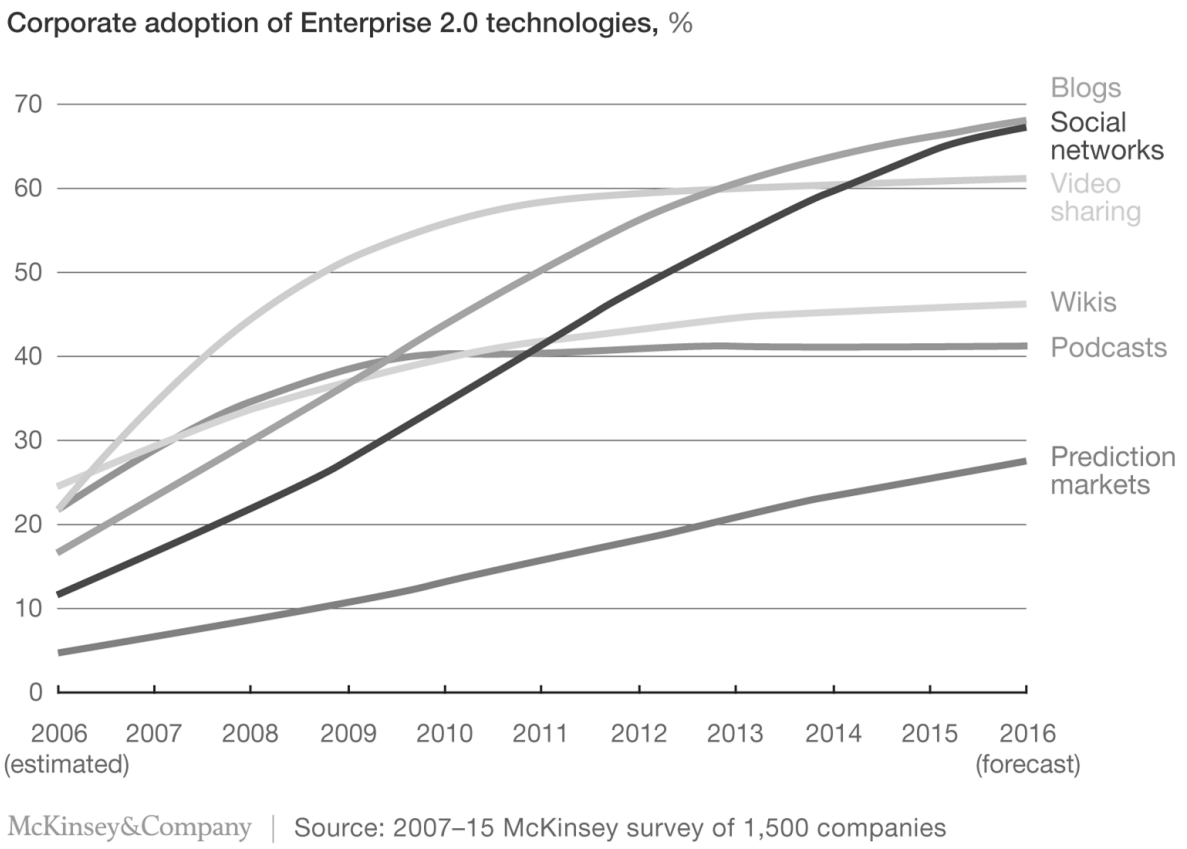
AGENDA

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!

BACKGROUND (1/6)

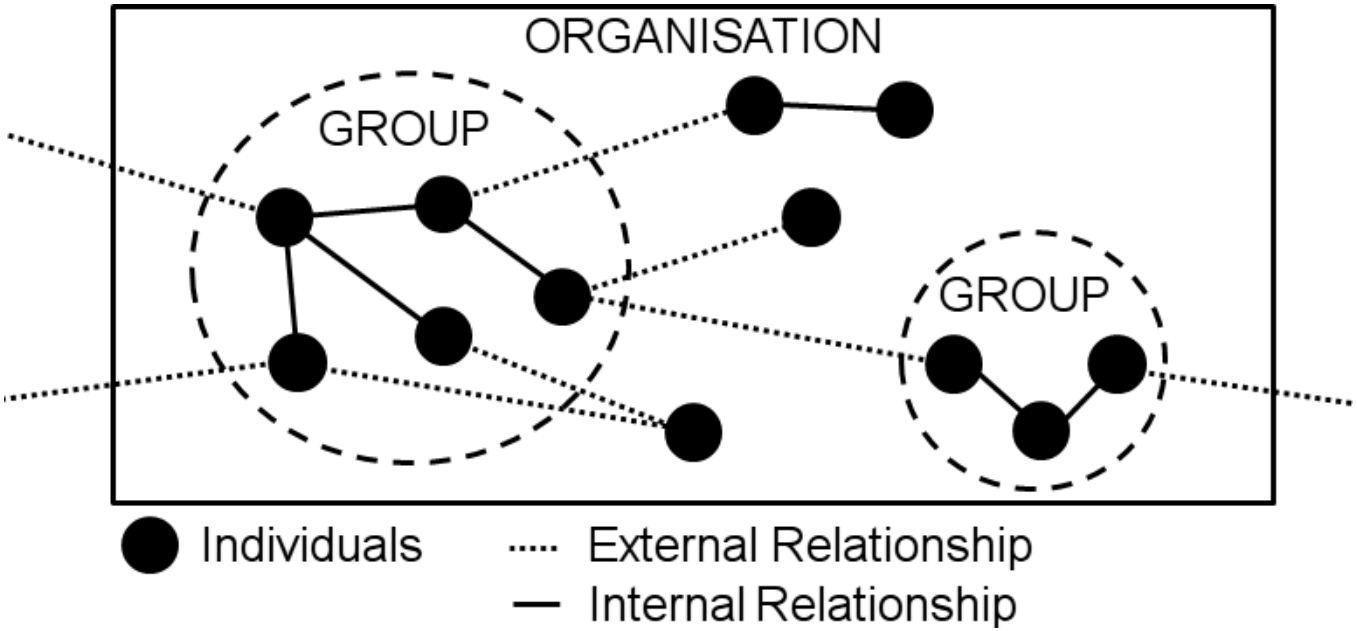
SOCIAL CAPITAL THEORY EXPLAINED.

“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.

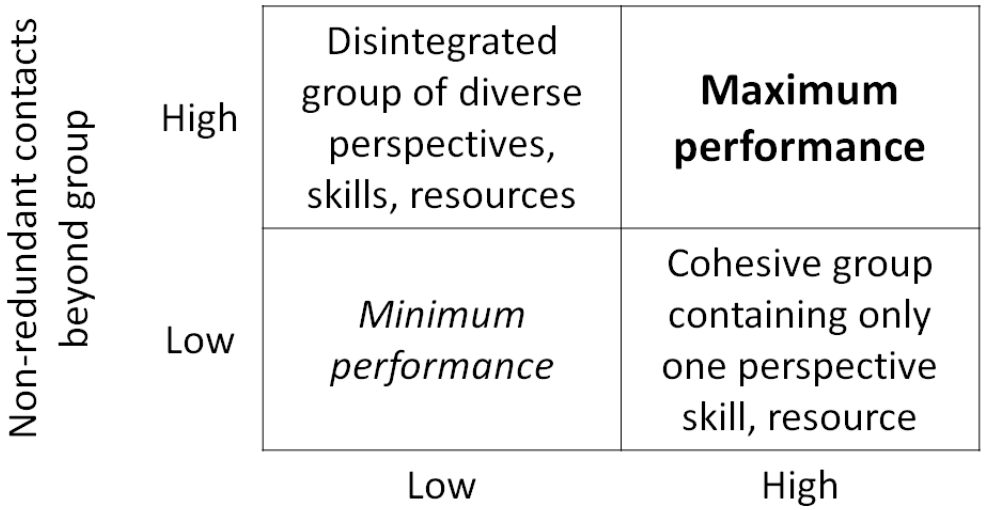


Social Capital can be conceptualised at different levels

→ **Collective Actors** (Borgatti et al., 1998 and Riemer, 2005)

BACKGROUND (3/6)

THE EMERGED SOCIAL CAPITAL THEORIES.

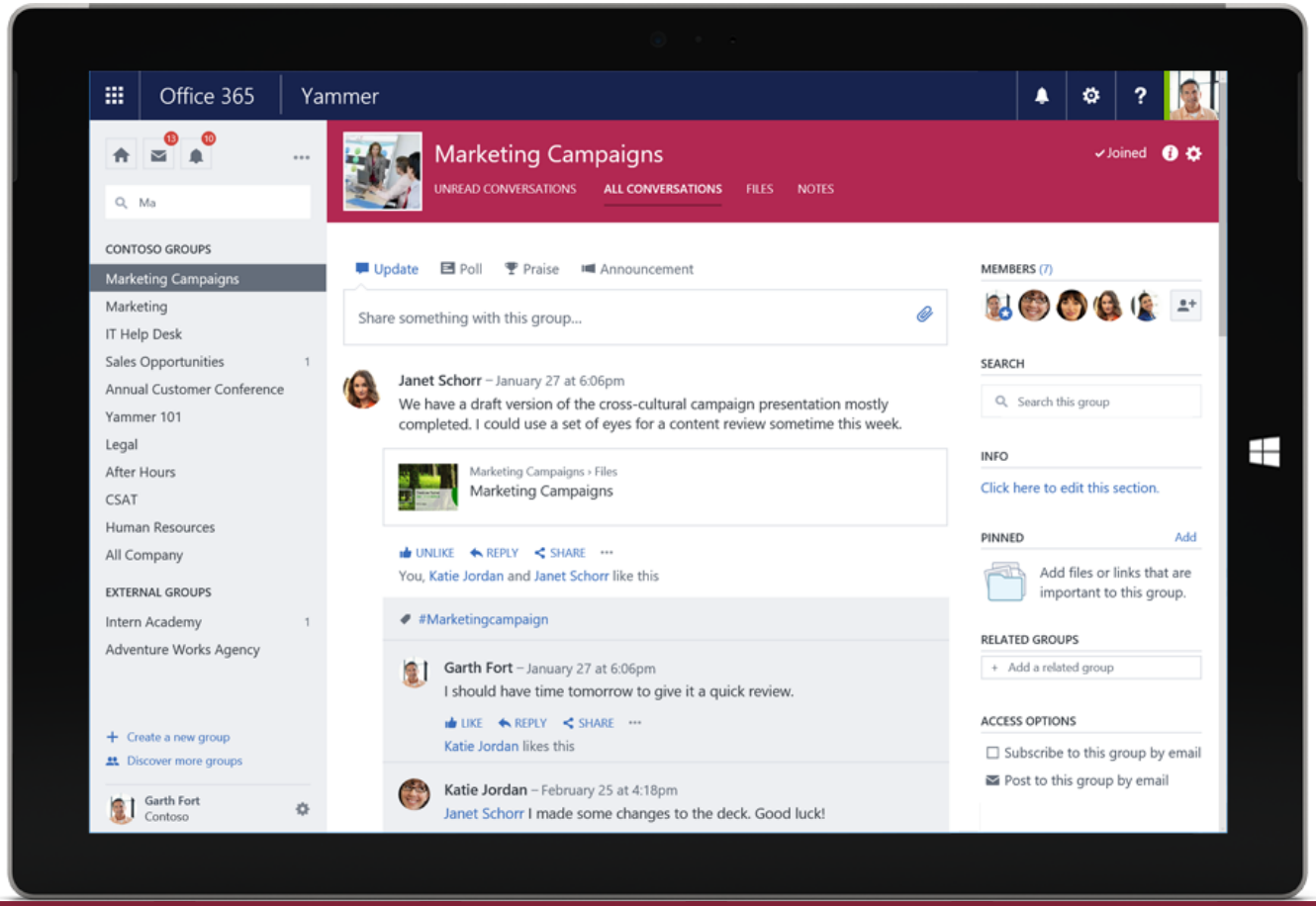


External → Weak Ties → Structural Holes (Granovetter, 1973)

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

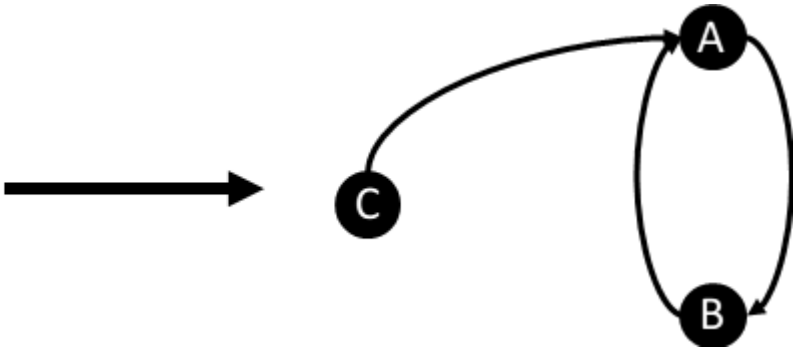
Effects

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)

BACKGROUND (6/6)

THE SOCIAL NETWORK ANALYSIS APPROACH.

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!**

APPROACH (1/2)

FOR THE METRIC REPOSITORY AND THE PROTOTYPE.

Metric Repository

Structured, general-use repository

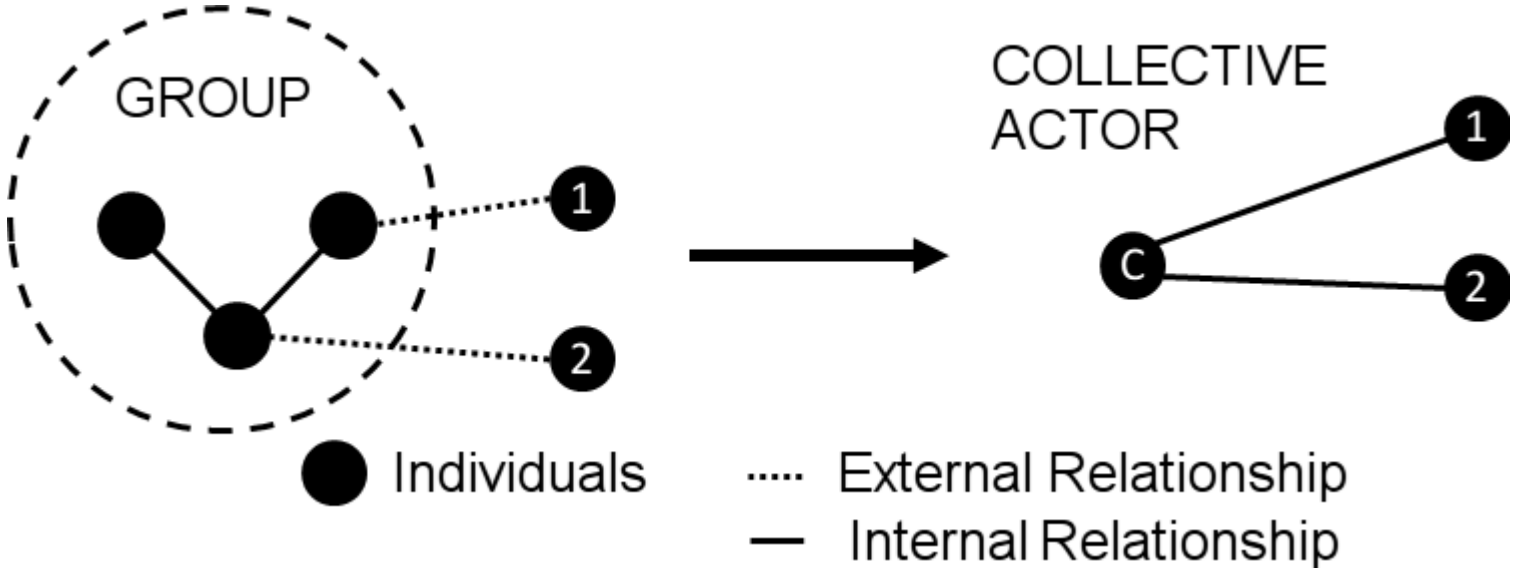
Sourced from the literature

Visualisation Prototype

Yammer dataset (Swoop) → Calculation Backend → Webservice → Visual Dashboard (IBCS)

APPROACH (2/2)

FOR THE GROUP-MODEL APPROACH.



- Merge group members to one new node
- Re-attach edges to the new node

REPOSITORY (1/3)

COMPREHENSIVE METRIC REPOSITORY STRUCTURE.

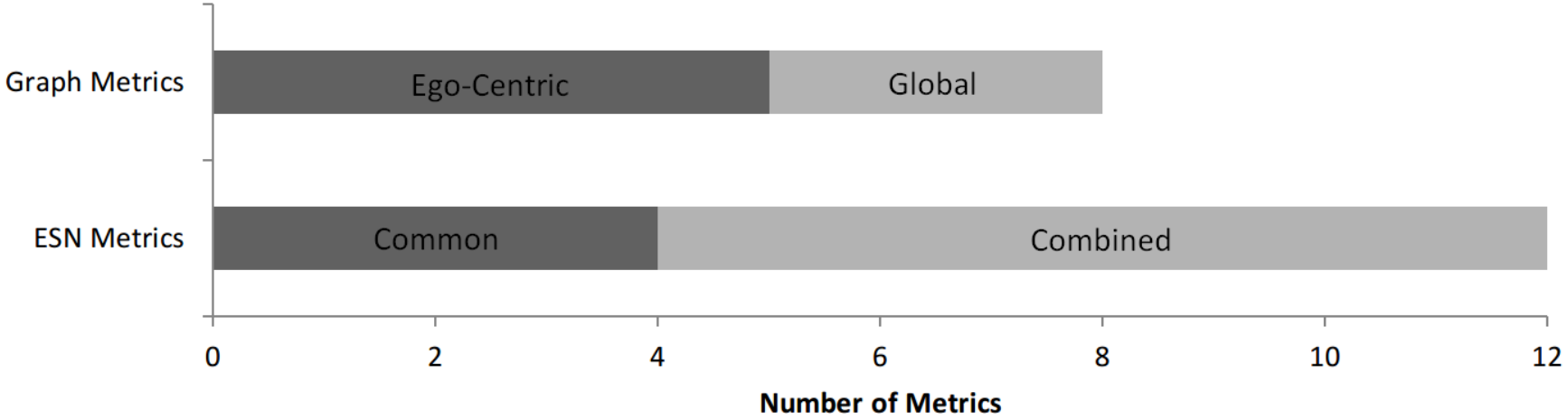
Structure

Name	Literature	Type	Scope
Text	Articles	Graph	Ego-Centric
	Books	ESN	Global

Description	Calculation	Interpretation	Overlaps
Text	Formula	Bonding	Other metrics
	SQL	Briding	

REPOSITORY (2/3)

SUMMARY OF THE METRIC REPOSITORY.



- 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**

REPOSITORY (3/3)

AN EXAMPLE FROM THE METRIC REPOSITORY.

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

$$density = \frac{|E|}{e_{max}} = \frac{|E|}{g * (g - 1)}$$

- Interpretation:

  Indicates Bonding Social Capital

  (Coleman‘s closure theory)

VISUALISATION PROTOTYPE

LIVE DEMO OF VISUALISATION PROTOTYPE.

DISCUSSION (1/2)

LIMITATIONS AND FUTURE OUTLOOK.

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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

THE IS RESEARCH NETWORK

www.ercis.org