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People Analytics

Introduction to Professor Haas

Professor Martine Haas



Wharton
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People Analytics

Basics of Collaboration

Professor Martine Haas

What is Collaboration?



“Collaboration is the action of working with others to produce or create something”

Our focus:

Collaboration between employees inside an organization

Why is Collaboration Important?



SAATCHI & SAATCHI



MONSANTO



McKinsey&Company



ARUP

The Big Question



How can we improve
collaboration inside
organizations?

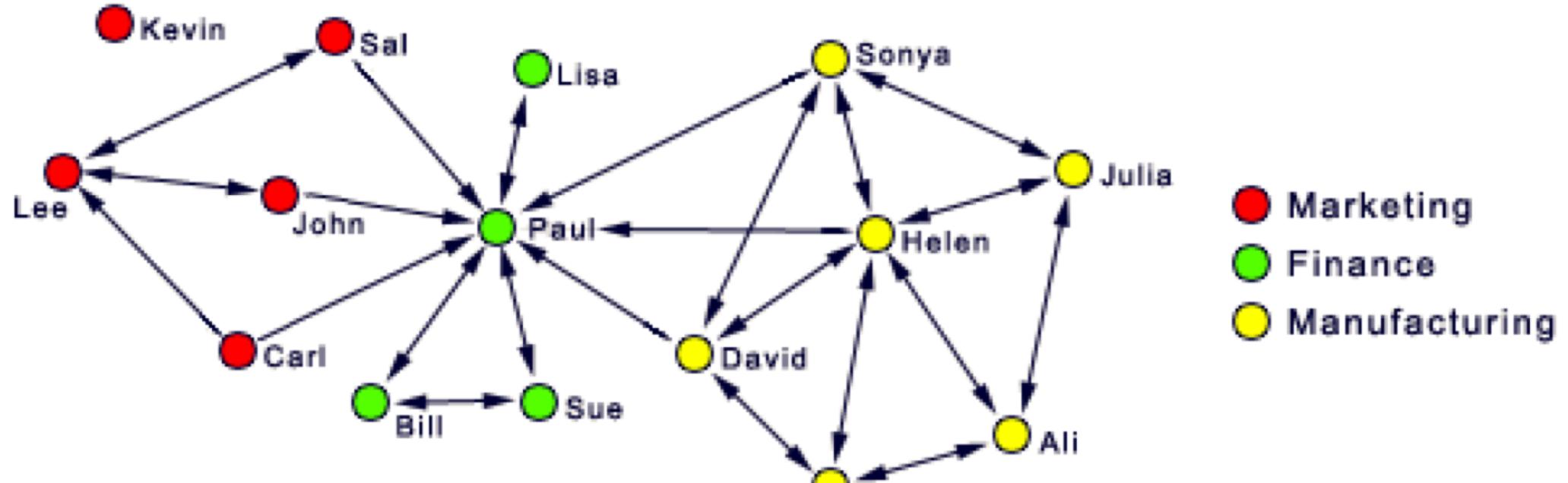
Analyzing Collaboration

- ? How can we describe collaboration patterns between employees?
- ? How can we map these collaboration patterns?
- ? How can we evaluate these collaboration patterns?
- ? How can we improve these collaboration patterns?

The Role of People Analytics

People Analytics is a data-driven approach
to managing people at work

Organizational Network Analysis (ONA)



A → B A seeks information from B

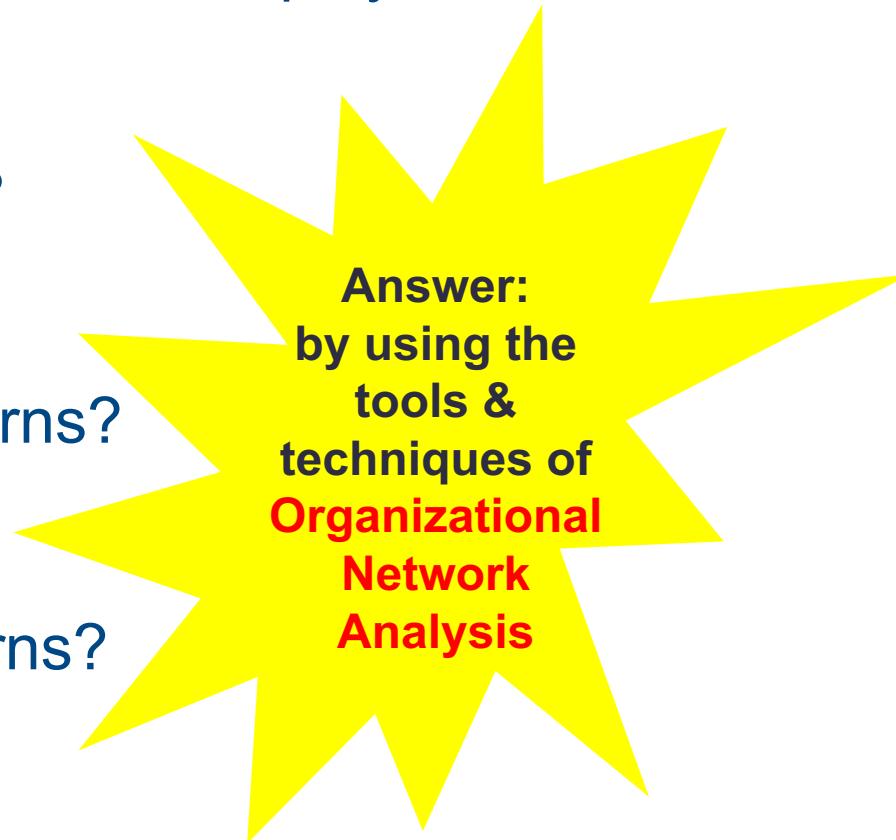
A ←→ B A and B seek information from each other

- Marketing
- Finance
- Manufacturing

Source: Rob Cross (2014)

Analyzing Collaboration

- ? How can we describe collaboration patterns between employees?
- ? How can we map these collaboration patterns?
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Describing Collaboration Networks

Professor Martine Haas

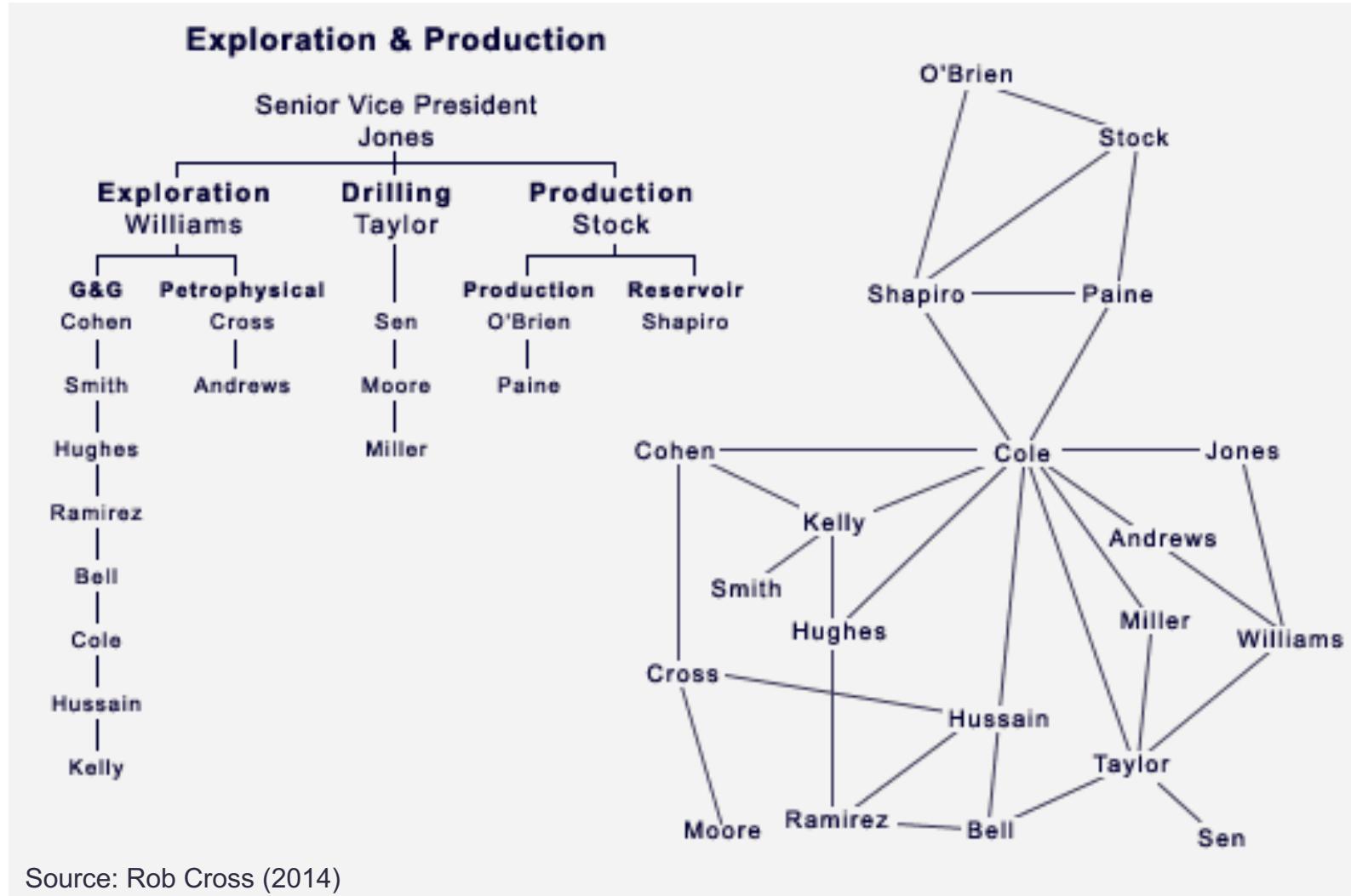
Collaboration

1. Introduction
2. Describing Collaboration Networks
3. Mapping Collaboration Networks
4. Evaluating Collaboration Networks
5. Intervening in Collaboration Networks

Describing Collaboration Networks

What Are Organizational Networks?

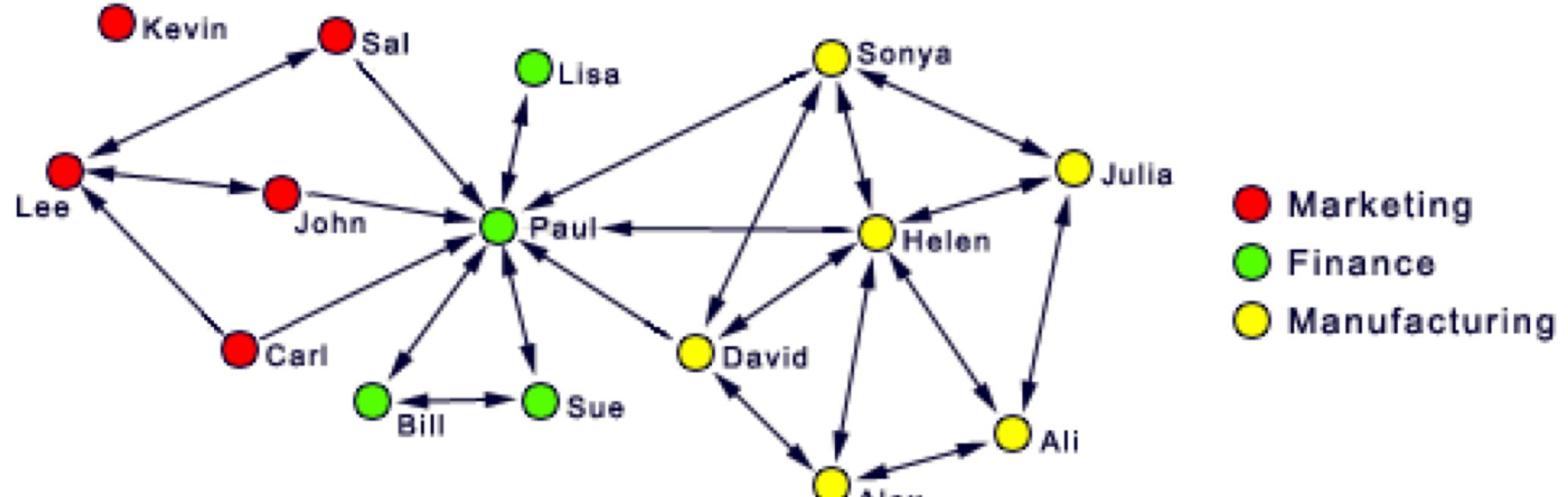
Formal structure
(org. chart)



Types of Organizational Networks

- Collaboration networks (information flows, knowledge sharing)
- Communication networks
- Friendship networks
- Advice networks
- Trust networks
- Etc.

Example of a Collaboration Network



A → B A seeks information from B

A ←→ B A and B seek information from each other

Who do you want to be, and why?

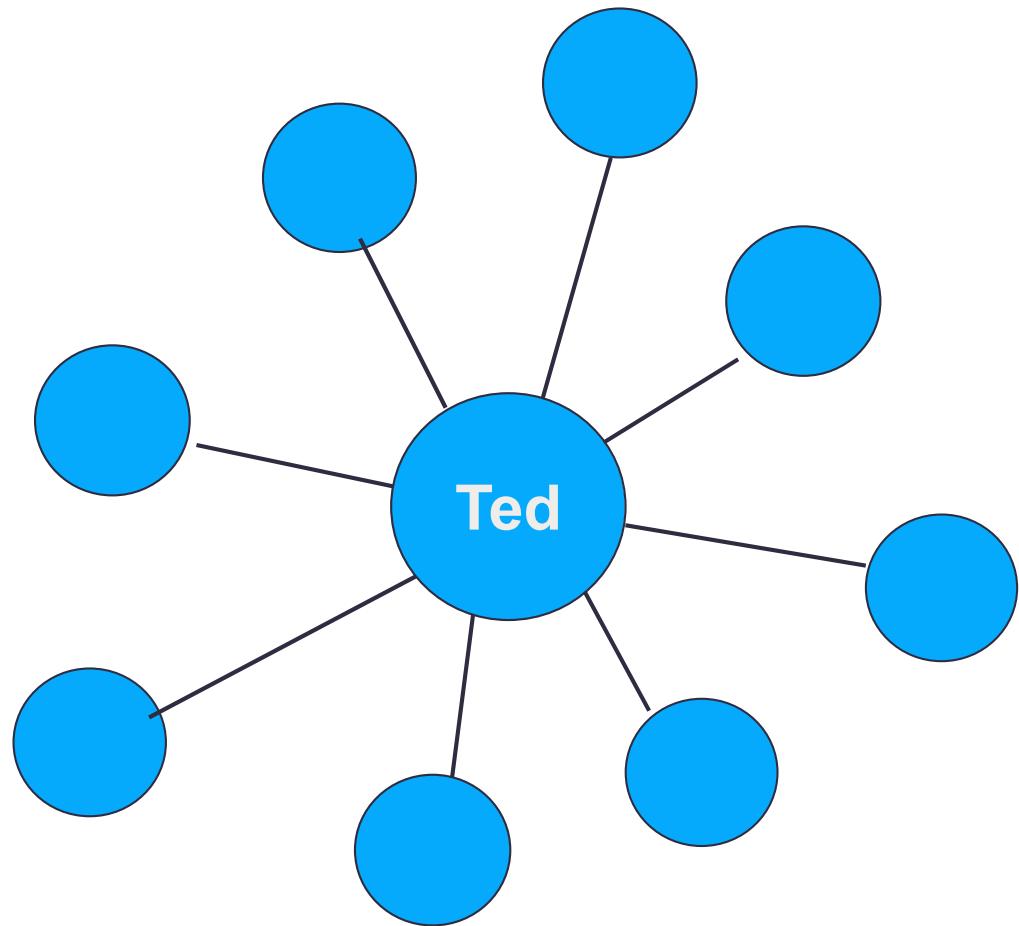
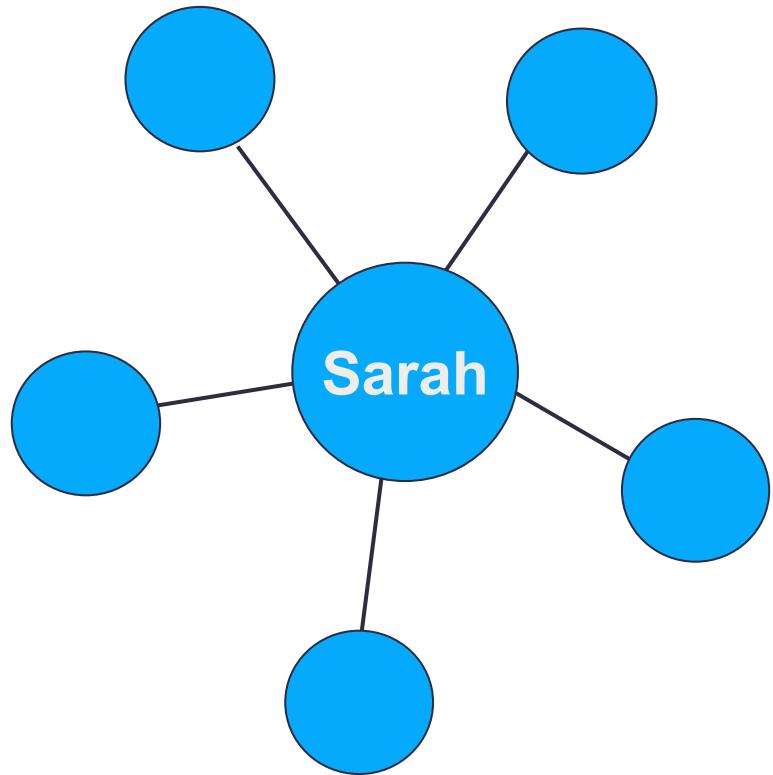
Source: Rob Cross (2014)

How Can We Describe Collaboration Patterns?

5 Building Blocks

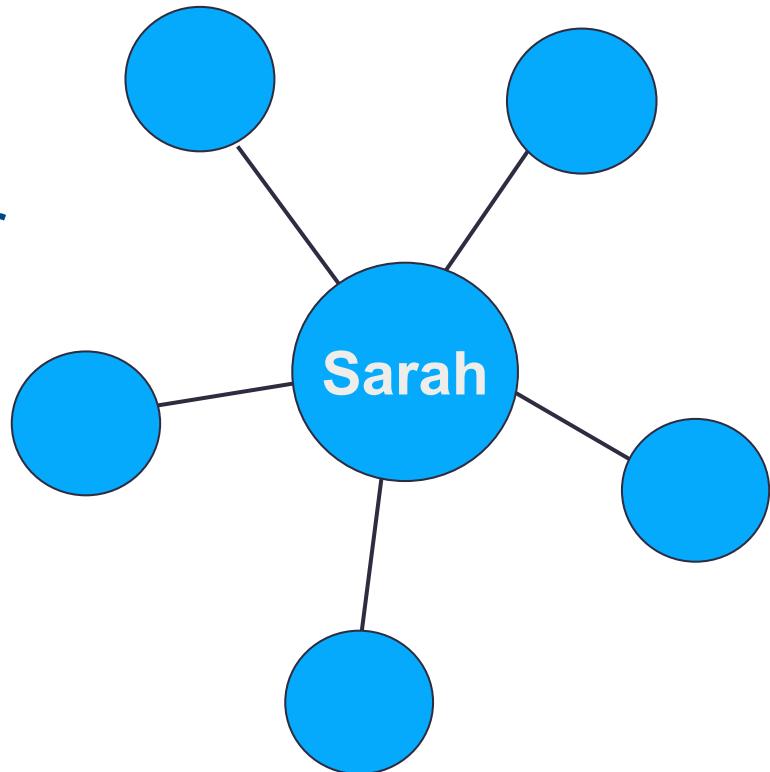
-  1. Network size
-  2. Network strength
-  3. Network range
-  4. Network density
-  5. Network centrality

Building Block 1: Network Size

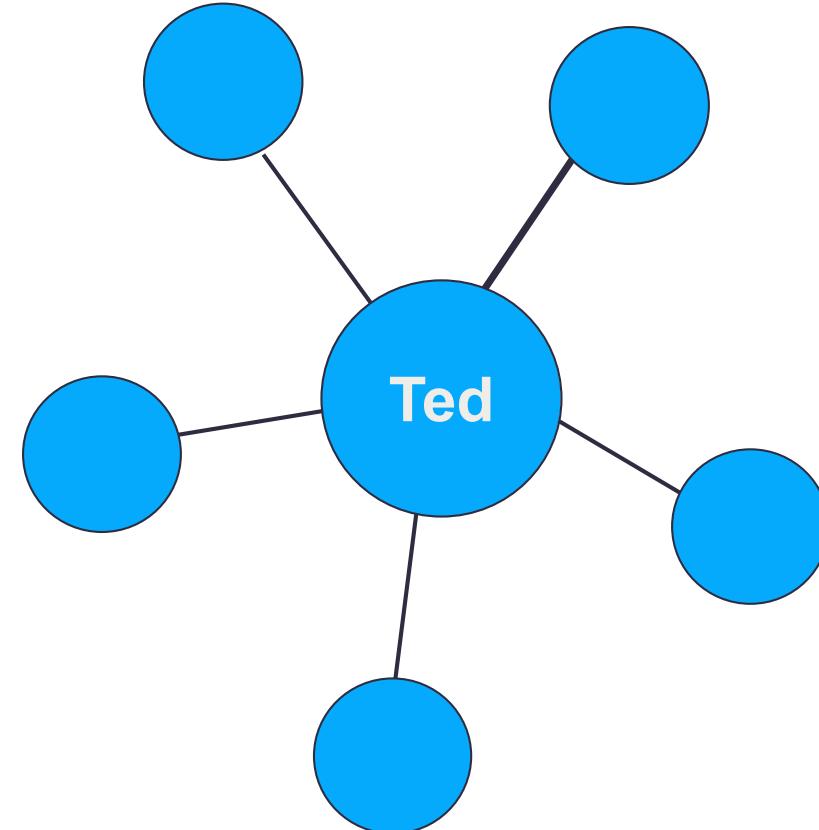


Building Block 2: Network Strength

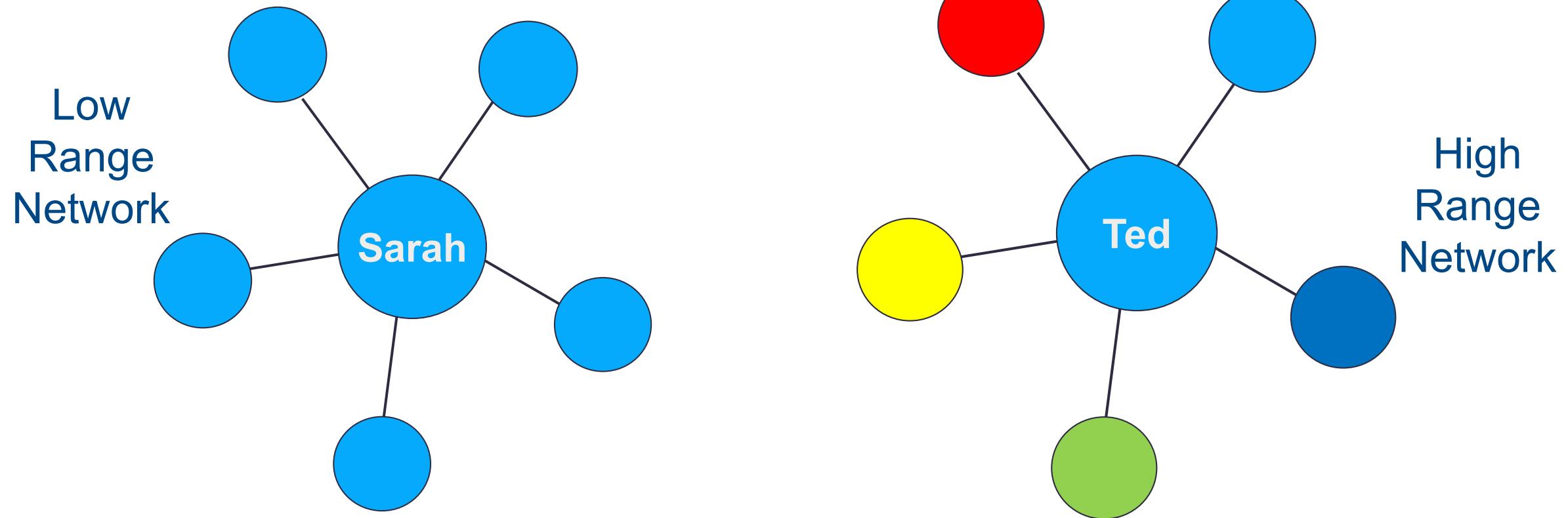
Stronger
Ties



Weaker
Ties

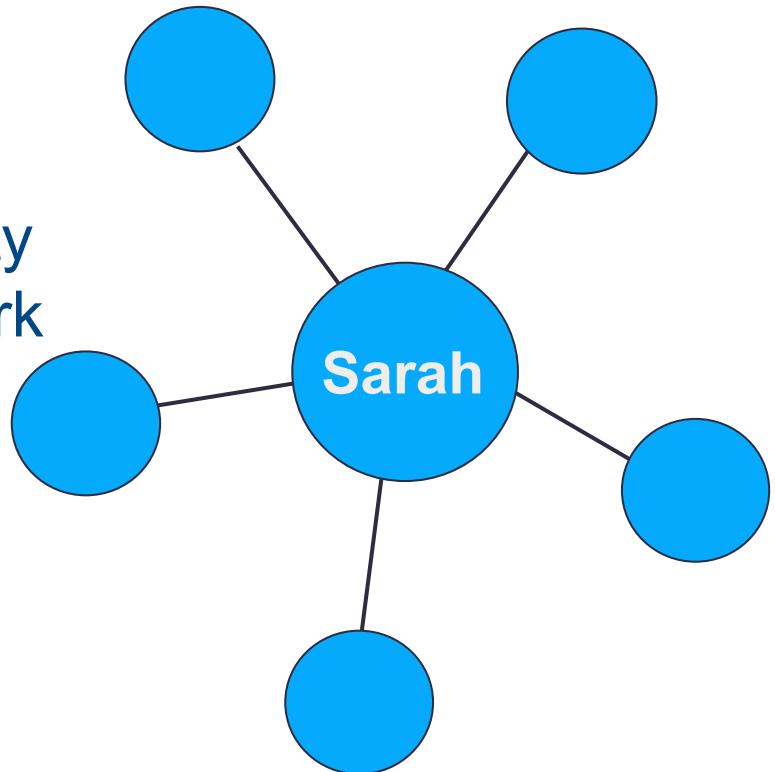


Building Block 3: Network Range

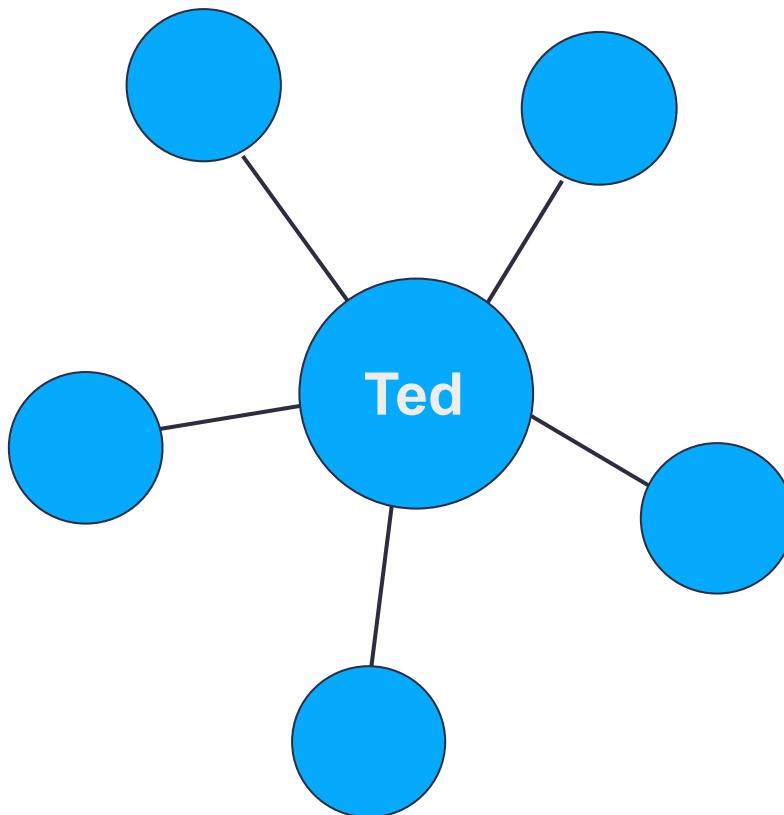


Building Block 4: Network Density

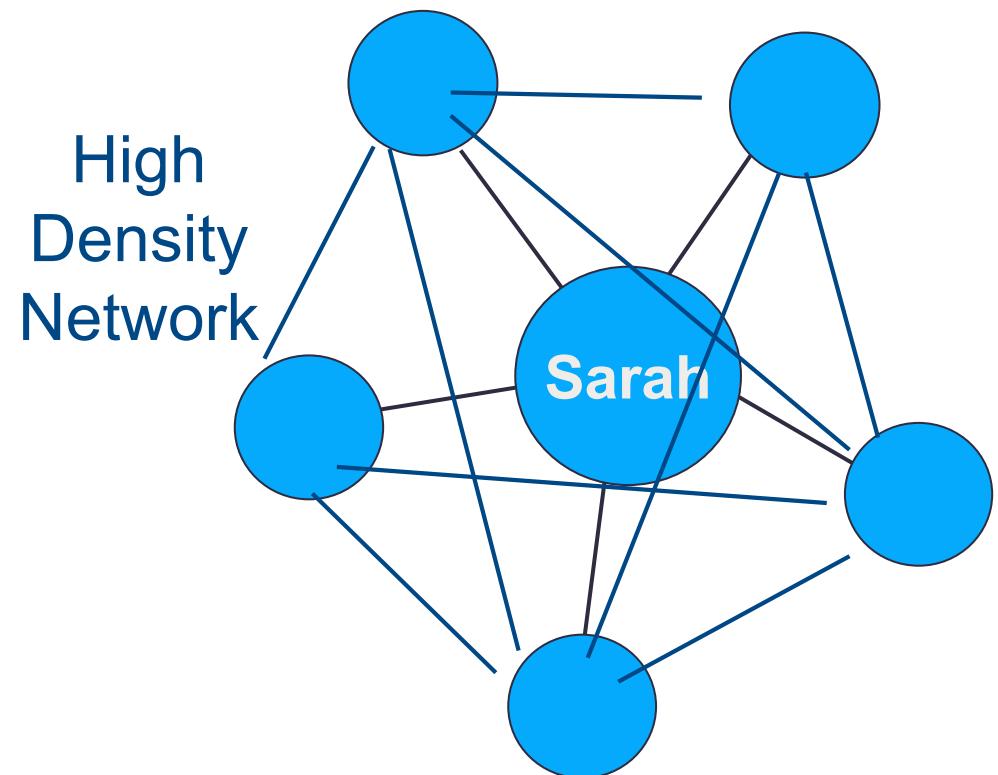
High
Density
Network



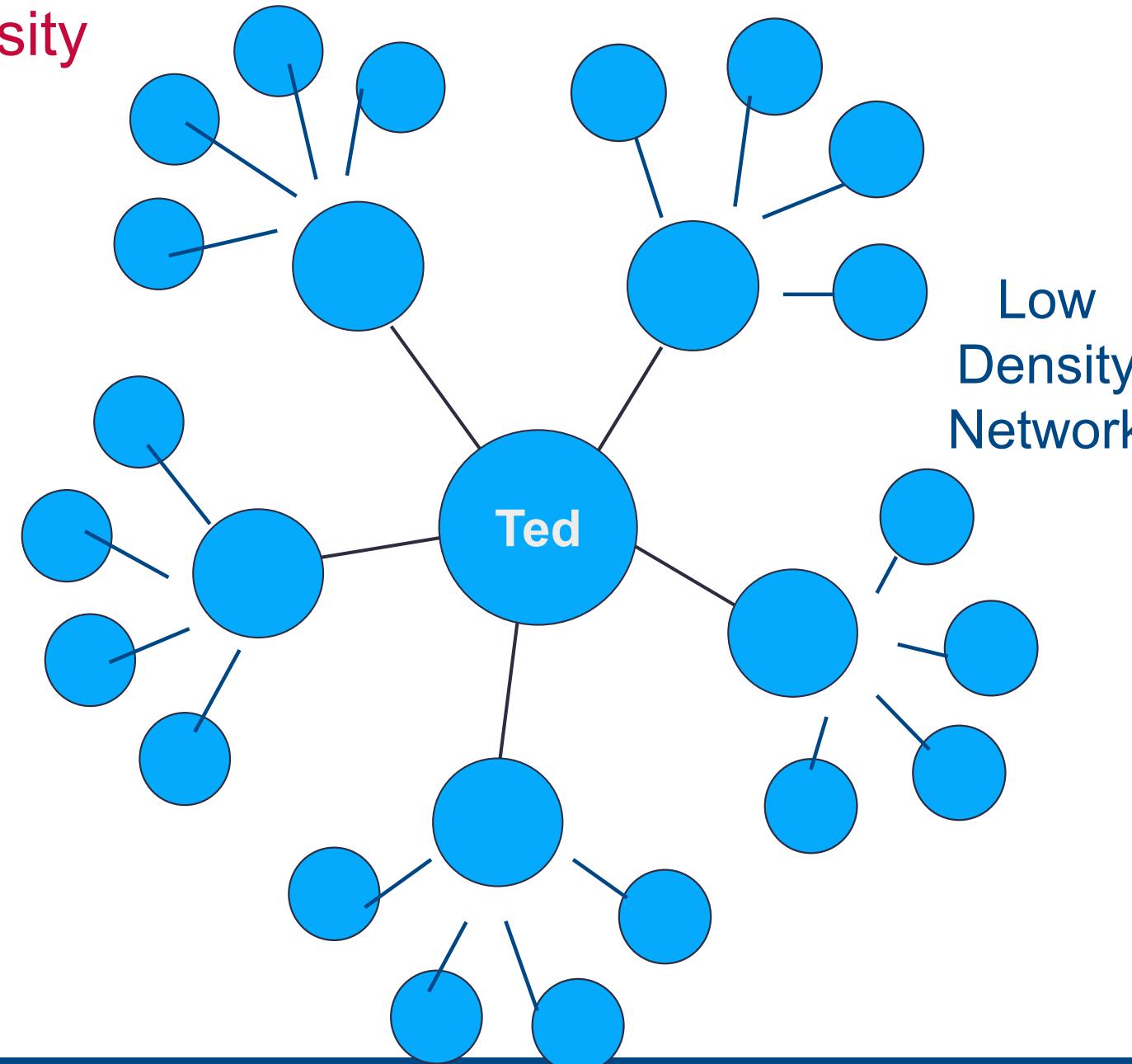
Low
Density
Network



Building Block 4: Network Density

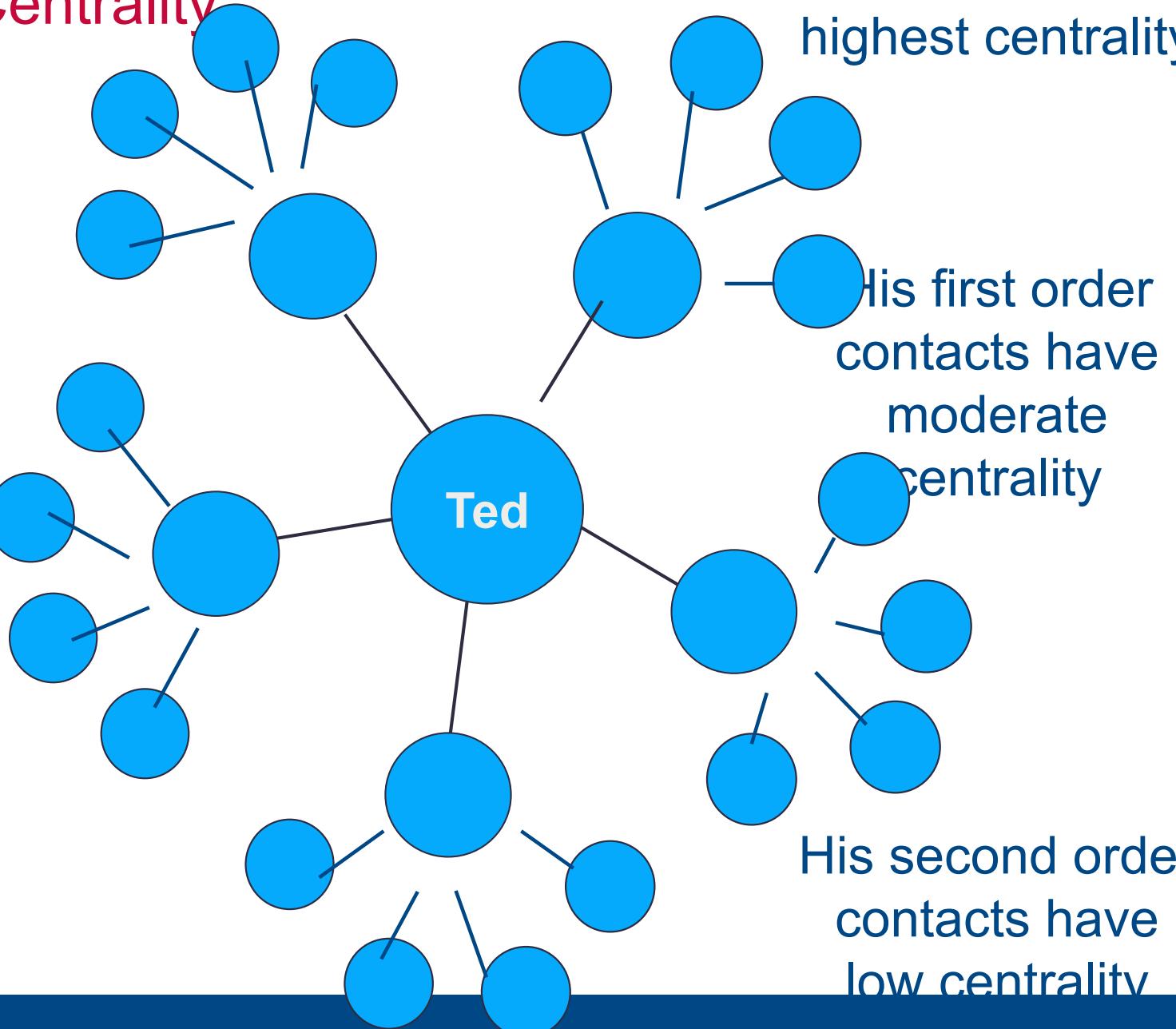
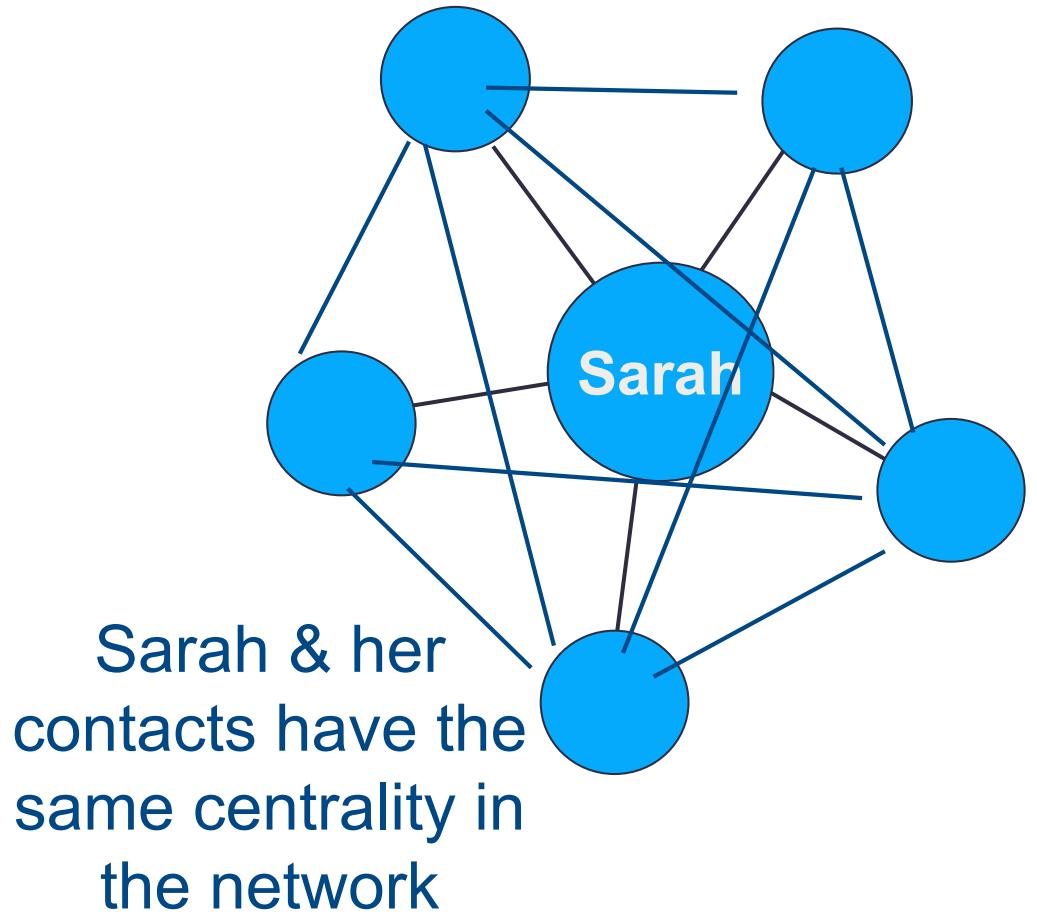


High
Density
Network

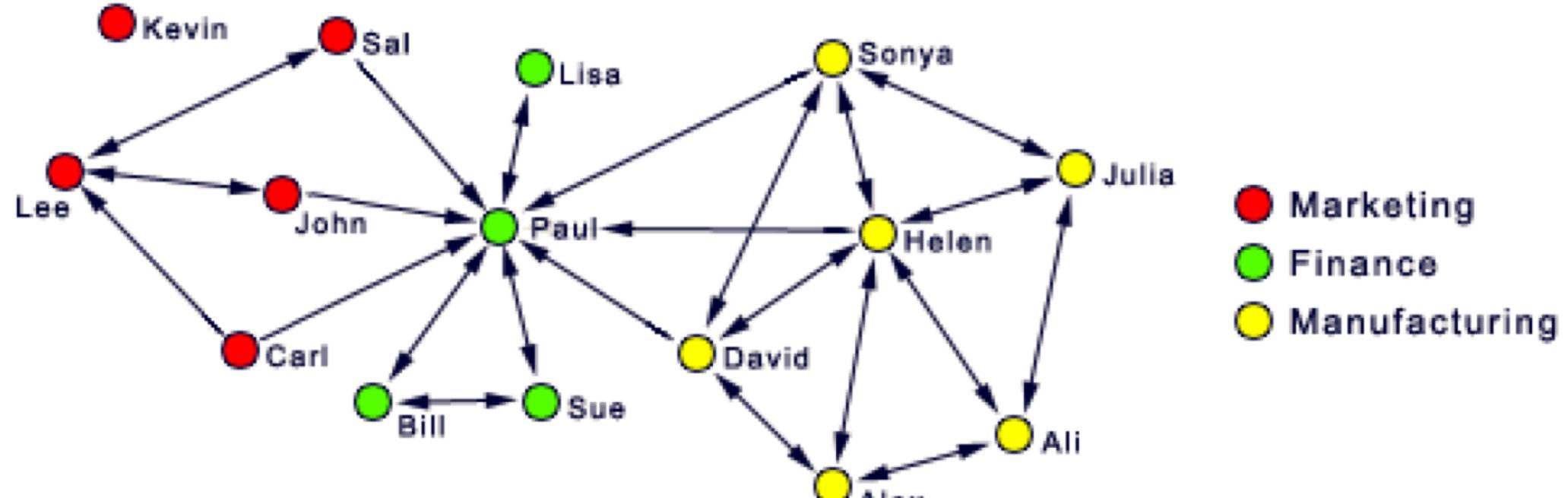


Low
Density
Network

Building Block 5: Network Centrality



Example of a Collaboration Network



A → B A seeks information from B

A ←→ B A and B seek information from each other

Who do you want to be, and why?

Source: Rob Cross (2014)



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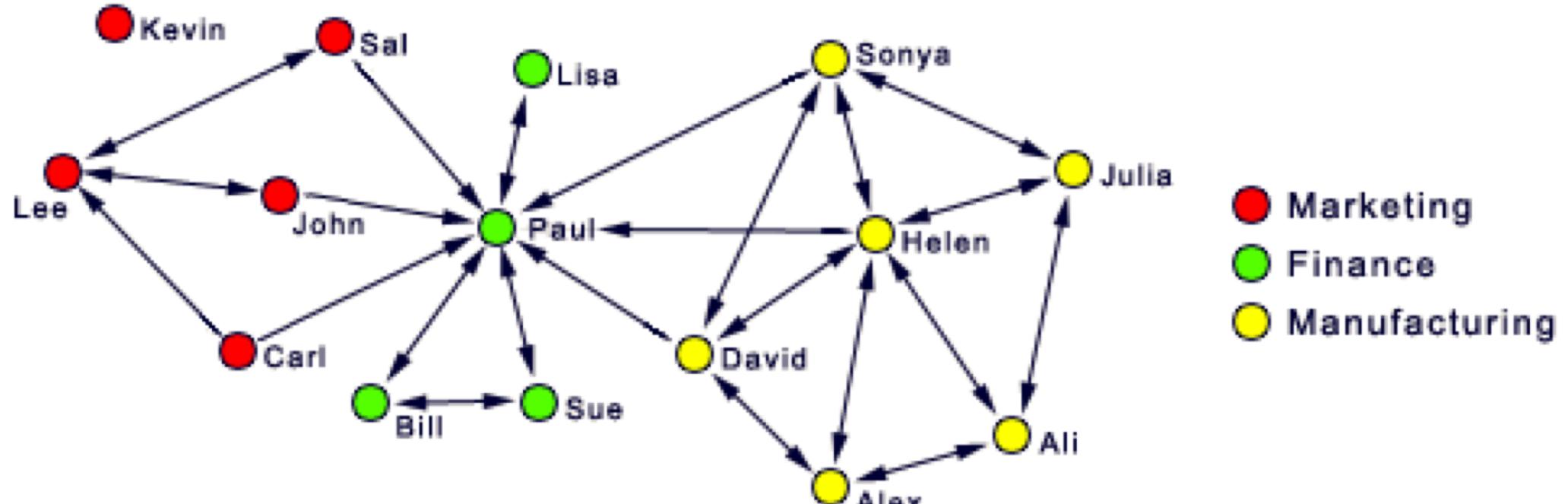
People Analytics

Mapping Collaboration Networks

Professor Martine Haas

Mapping Collaboration Networks

How Can We Capture Collaboration Patterns?

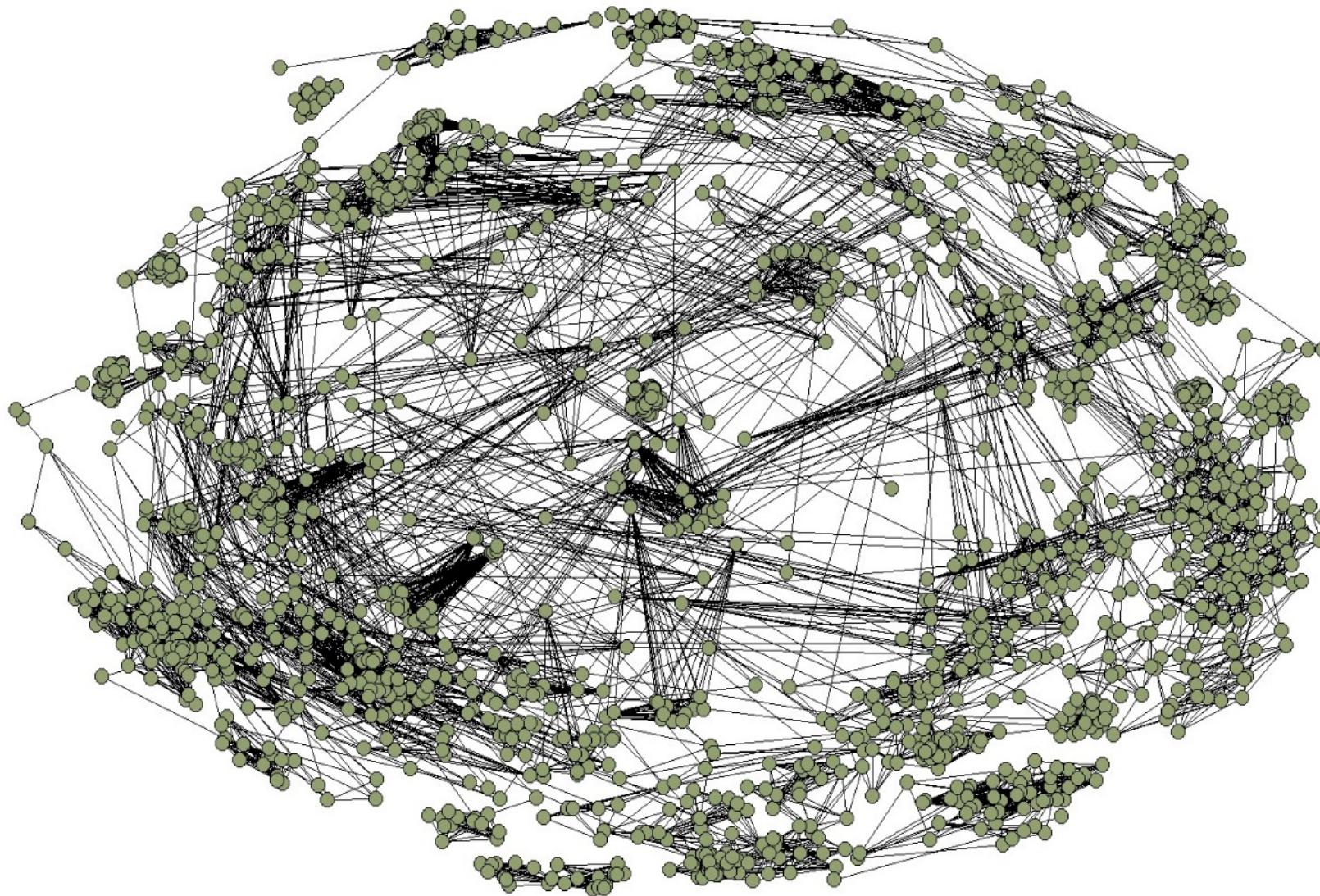


A → B A seeks information from B

A ←→ B A and B seek information from each other

Source: Rob Cross (2014)

How Can We Capture Collaboration Patterns?



Network Data: Example

How frequently does A seek information from B?

	Alex	Ali	Bill	Carl	David	Helen	John	Julia	Kevin	Lee	Lisa	Paul	Sal	Sonya Sue
Alex	x													
Ali		x												
Bill			x											
Carl				x										
David					x									
Helen						x								
John							x							
Julia								x						
Kevin									x					
Lee										x				
Lisa											x			
Paul												x		
Sal													x	
Sonya													x	
Sue														x

Collecting Network Data

- Surveys
- Other sources

Collecting Network Data via Surveys



Collecting Network Data via Surveys



- Sample boundaries
 - formal units
 - locations
 - communities
 - cohorts
 - teams, etc.
- Sample size:
 - N=25-300

Collecting Network Data via Surveys



- Sample boundaries
 - formal units
 - locations
 - communities
 - cohorts
 - teams, etc.
- Sample size:
 - N=25-300
- Opening statement
 - Purpose
 - Confidentiality
- Network questions
- Additional questions
- Order & format
- Test & refine
- 10-15 mins MAX

Network Questions: Example

Below is a list of all the members of your product development team.
How frequently do you go to each of these individuals to seek information related to your work?

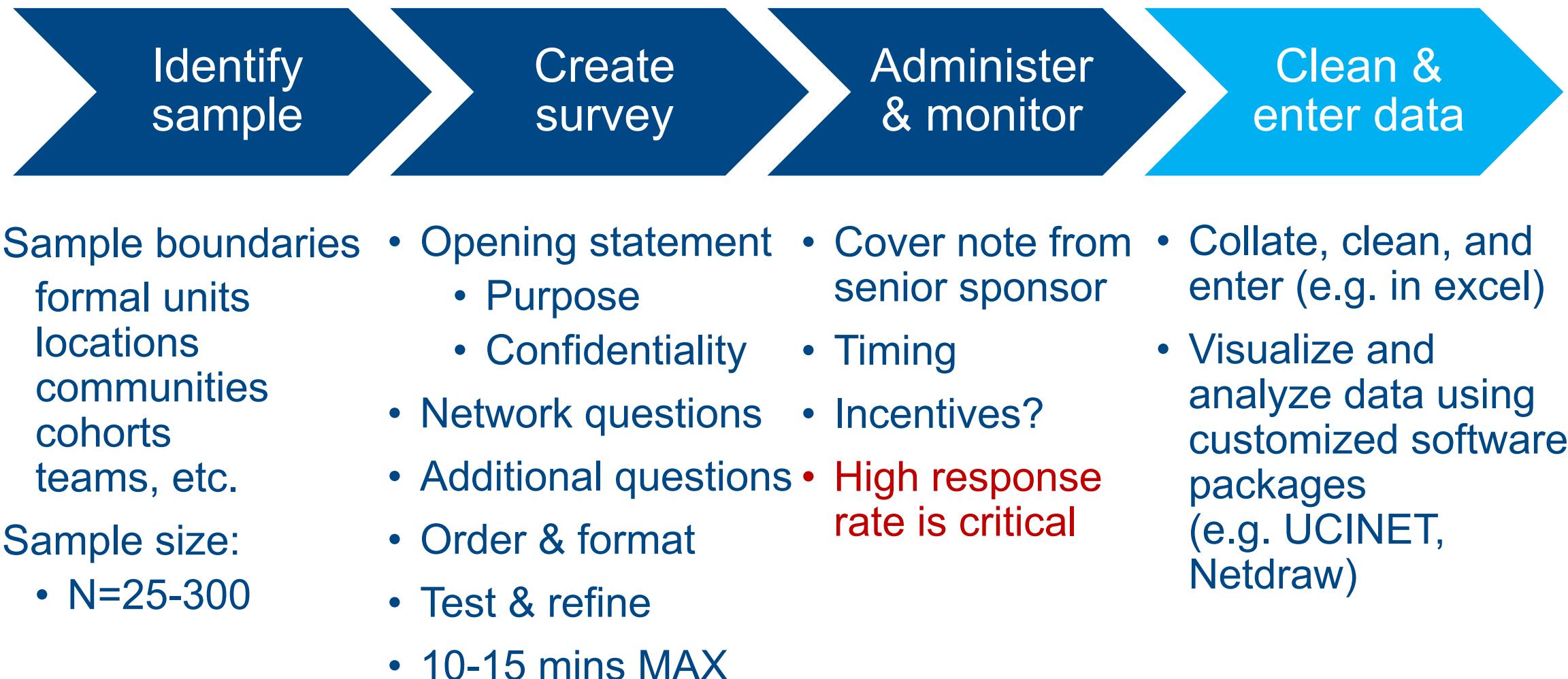
	Less than once a month	About once a month	About 2 or 3 times per month	About once per week	About 2 or 3 times per week	Daily or almost daily
Alex	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ali	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bill	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carl	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
David	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
John	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Julia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kevin	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lisa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paul	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sonya	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

Collecting Network Data via Surveys



- Sample boundaries
 - formal units
 - locations
 - communities
 - cohorts
 - teams, etc.
- Sample size:
 - N=25-300
- Opening statement
 - Purpose
 - Confidentiality
- Network questions
- Additional questions
- Order & format
- Test & refine
- 10-15 mins MAX
- Cover note from senior sponsor
- Timing
- Incentives?
- **High response rate is critical**

Collecting Network Data via Surveys



Network Data: Example

How frequently does A seek information from B?

	Alex	Ali	Bill	Carl	David	Helen	John	Julia	Kevin	Lee	Lisa	Paul	Sal	Sonya Sue
Alex	x													
Ali		x												
Bill			x											
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Helen						x								
John							x							
Julia								x						
Kevin									x					
Lee										x				
Lisa											x			
Paul												x		
Sal													x	
Sonya													x	
Sue														x

Collecting Network Data via Surveys: Some Issues

PROS:

- Customized, detailed information from target sample

CONS:

- High response rates are critical
- Network cannot be too large
- Survey cannot be too long
- Questions must be worded and interpreted with care
- Confidentiality is critical
- Relatively costly method of data collection

Collecting Network Data from Other Sources

- Big Data:
 - interactions via email, phone calls, computer conferencing, bulletin boards, social media, etc.
- Archival Records:
 - corporate databases - e.g. info on shared project assignments, work histories, event attendance
 - public databases - e.g. info on co-patenting, co-authorship, co-citations
 - Fieldwork:
 - observations, diaries, electronic tags, etc.

Collecting Network Data from Other Sources: Some Issues

PROS:

- Information on larger networks may be available
- May be less invasive
- May be less expensive
- May provide more objective measures

CONS:

- Privacy concerns
- What do available measures actually capture?
- Large datasets can generate statistically significant but unimportant findings



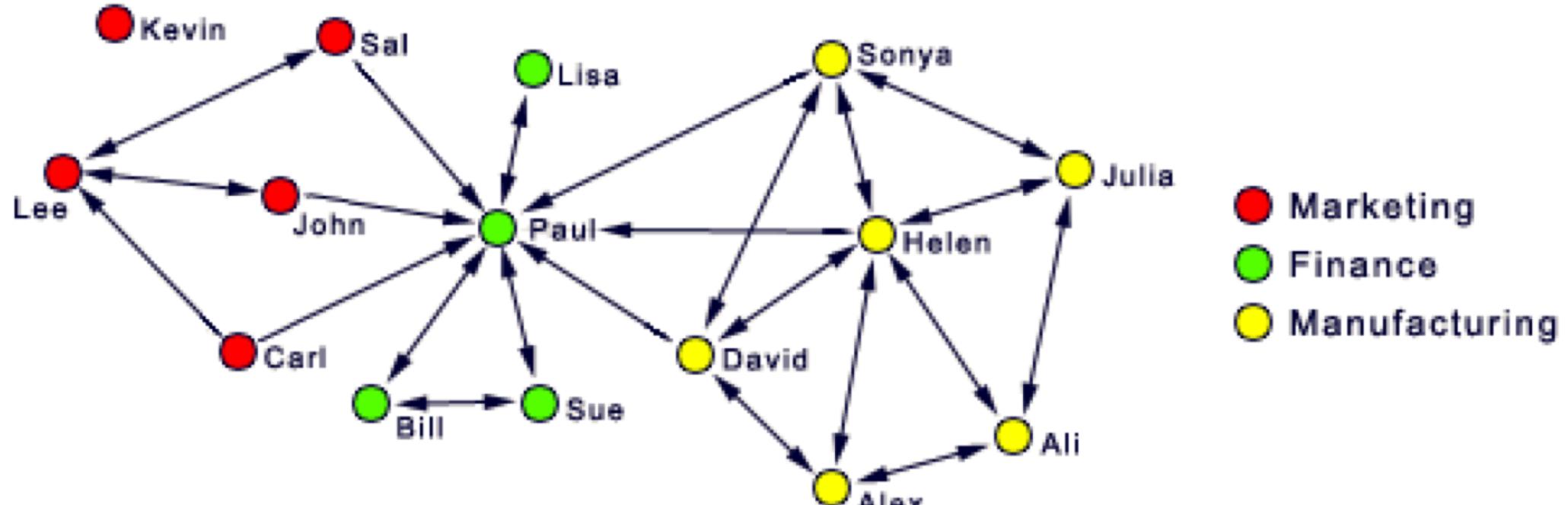
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People Analytics Evaluating Collaboration Networks

Professor Martine Haas

Evaluating Collaboration Networks

How Can We Evaluate Collaboration Patterns?

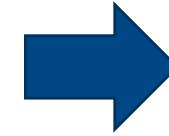
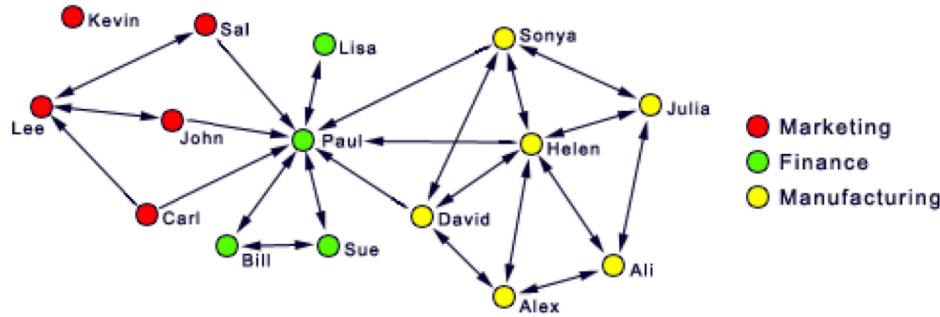


A → B A seeks information from B

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Source: Rob Cross (2014)

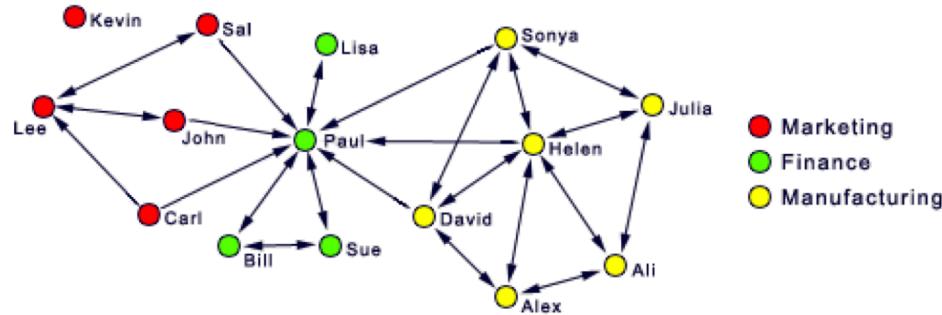
How Can We Evaluate Collaboration Patterns?



How do collaboration patterns vary?

How do collaboration patterns matter for important outcomes? (individual, group, or organizational)

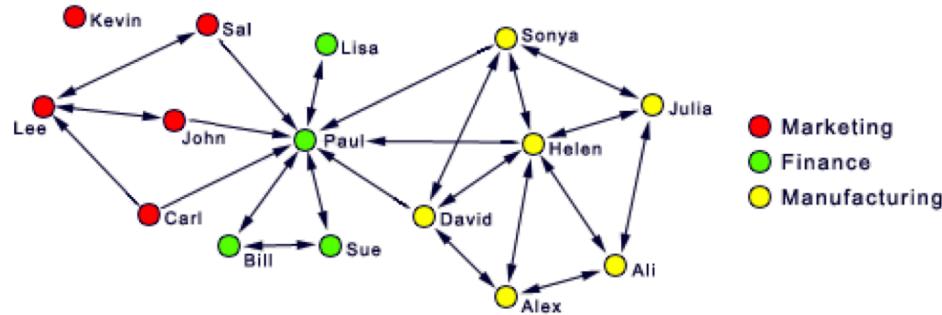
How Can We Evaluate Collaboration Patterns?



5 Building Blocks

- Network size
- Network strength
- Network range
- Network density
- Network centrality

How Can We Evaluate Collaboration Patterns?



	Lee	John	Paul	Helen	Julia
Network size (inbound ties: number of people who seek information from X)	3	1	9	5	3
Network size (outbound ties: number of people from whom X seeks information)	2	2	3	6	3

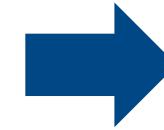
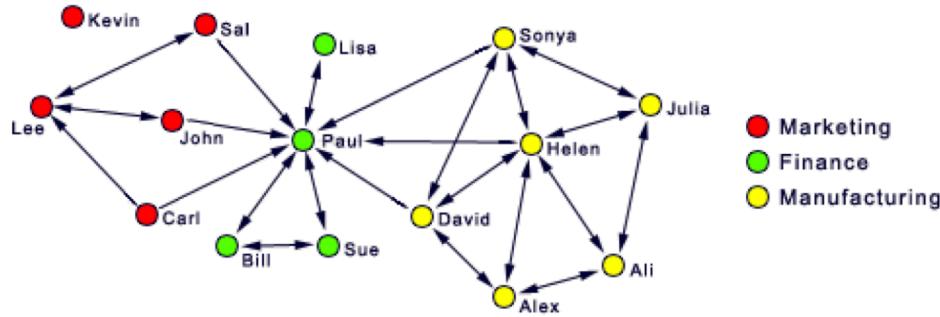
Simple descriptive statistics:

- Compare across individuals
- Compare changes over time

Implications for managing employees:

- Performance assessment
- Roles & responsibilities
- Pay & promotions
- Training & mentoring

How Can We Evaluate Collaboration Patterns?



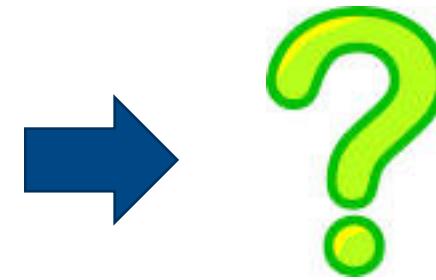
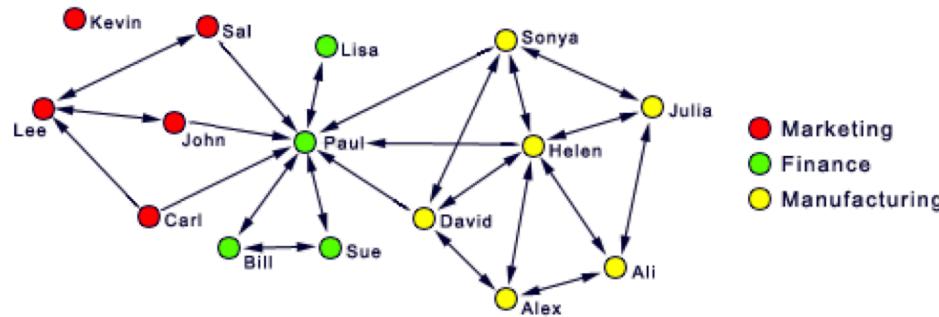
5 Building Blocks

- Network size
- Network strength
- Network range
- Network density
- Network centrality

Individual Outcomes:

- Performance
- Satisfaction
- Commitment
- Burnout
- Turnover etc.

How Can We Evaluate Collaboration Patterns?



Correlational & multivariate analysis

- Identify relationships between network variables and outcomes

Implications for managing employees:

- Performance assessment
- Roles & responsibilities
- Pay & promotion
- Training & mentoring
- Job rotations & career development
- Retention

Outcome variable:	
	Performance
Network variables:	
Network size (inbound ties: number of people who seek information from X)	+
Network size (outbound ties: number of people from whom X seeks information)	-



BEWARE!

There is no one “best” collaboration network for every organization in every situation!

To understand what’s best for your particular organization in your particular situation, you’ll need to collect and analyze the data!

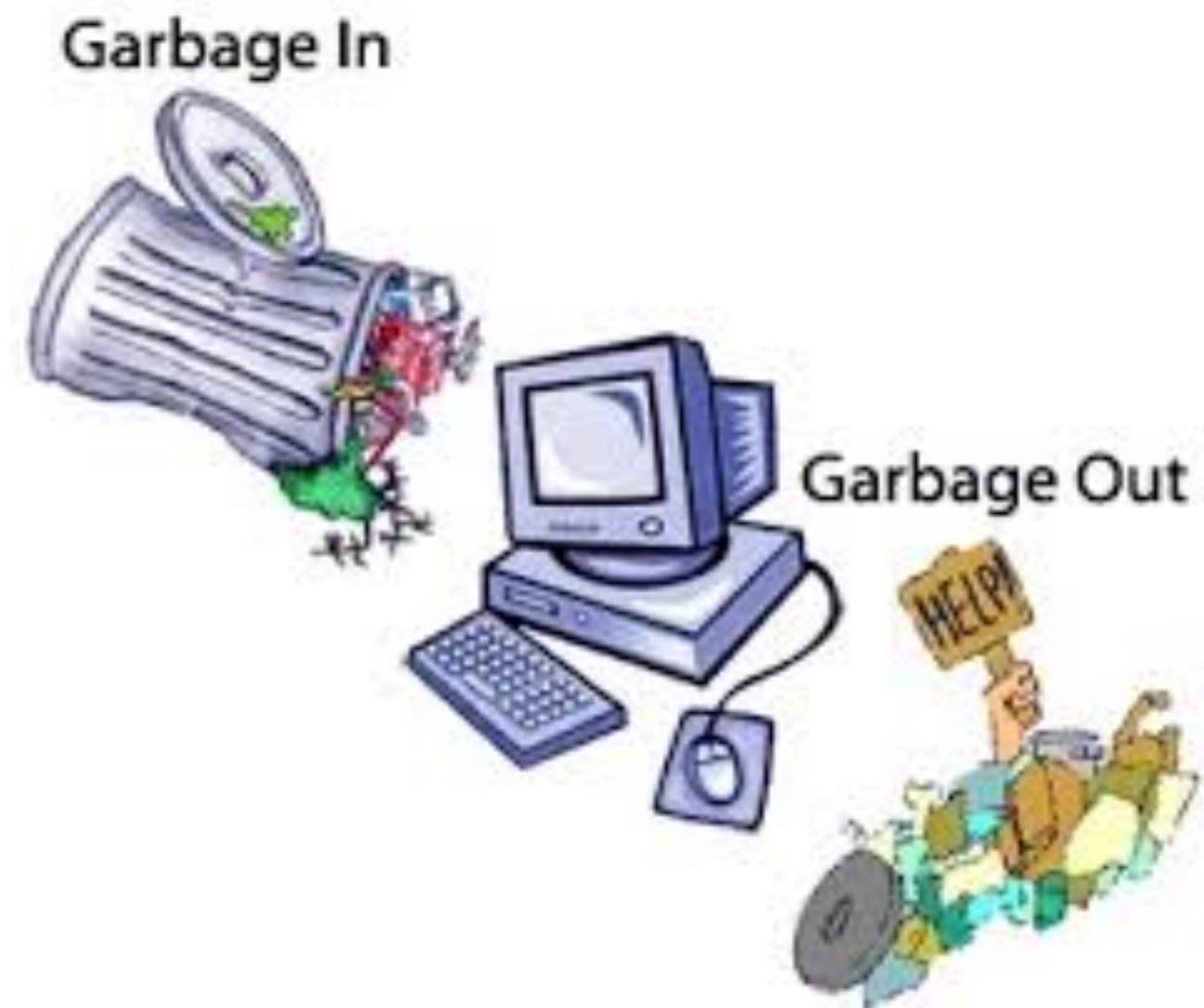


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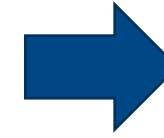
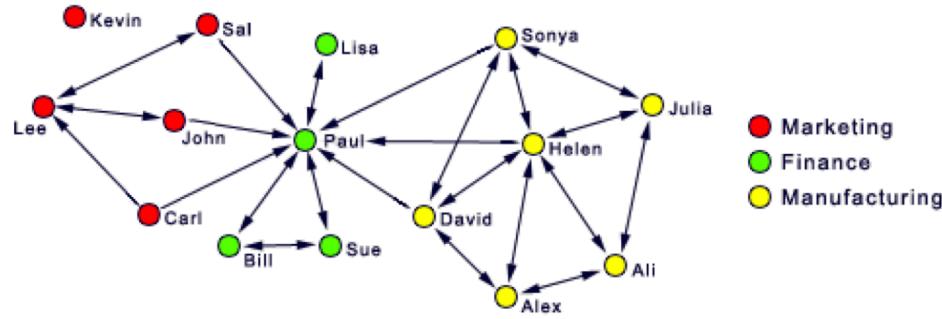
People Analytics Measuring Outcomes

Professor Martine Haas

Remember!



How do Collaboration Patterns Matter for Important Outcomes?



5 Building Blocks

- Network size
- Network strength
- Network range
- Network density
- Network centrality

Individual Outcomes:

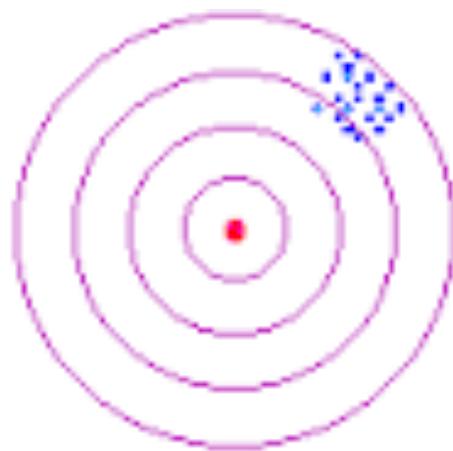
- Performance
- Satisfaction
- Commitment
- Burnout
- Turnover etc.

Example: Measuring Performance

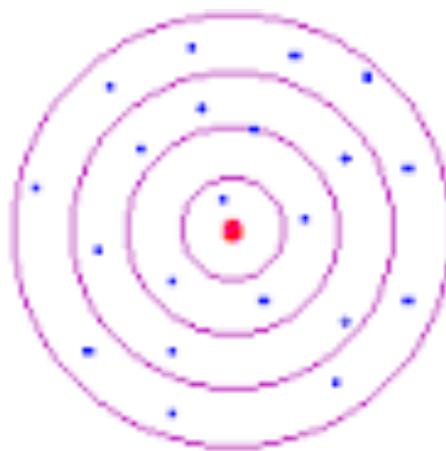
What is a strong measure of performance?

- **Level of analysis** – is the focus on performance of employees? teams? organization?
- **Reliability** – are assessments consistent? (e.g., over time, across raters)
- **Validity** – are assessments accurate? (i.e. measure what they are supposed to measure)

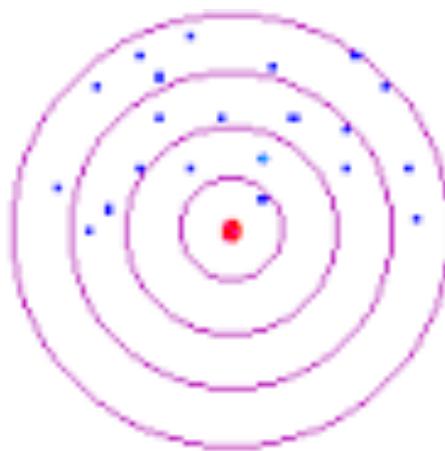
Validity & Reliability



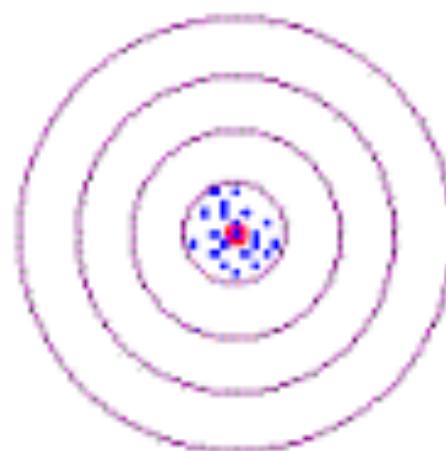
**Reliable
Not Valid**



**Valid
Not Reliable**



**Neither Reliable
Nor Valid**



**Both Reliable
And Valid**

Example: Measuring Performance

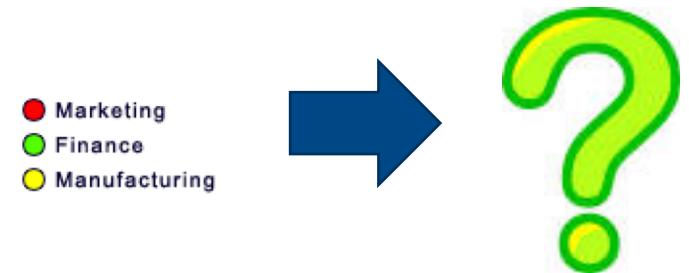
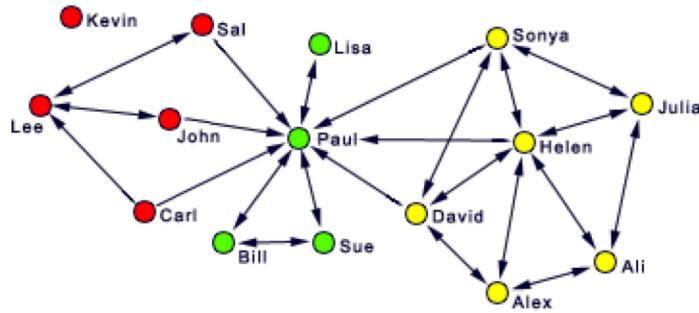
What is a strong measure of performance?

- **Level of analysis** – is the focus on performance of employees? teams? organization?
- **Reliability** – are assessments consistent? (e.g., over time, across raters)
- **Validity** – are assessments accurate? (i.e. measure what they are supposed to measure)
- **Comparability** – consistently measured & meaningful for all units in dataset
- **Comprehensiveness** – available for all or most units in the dataset
- **Cost effectiveness** – not too expensive to collect
- **Causality** – defensible as an outcome variable

Example: Measuring Performance

What is a strong measure of performance?

- Level of analysis
- Reliability
- Validity
- Comparability
- Comprehensiveness
- Cost effectiveness
- Causality



Individual Outcomes:

- **Performance**
 - Sales per quarter?
 - Costs savings?
 - Self-reported 1-3 ratings
 - Manager-reported 1-3 ratings
 - Bonus? Etc.

The Role of People Analytics

People Analytics is a data-driven approach
to managing people at work





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Intervening in Collaboration Networks

Professor Martine Haas

Intervening in Collaboration Networks

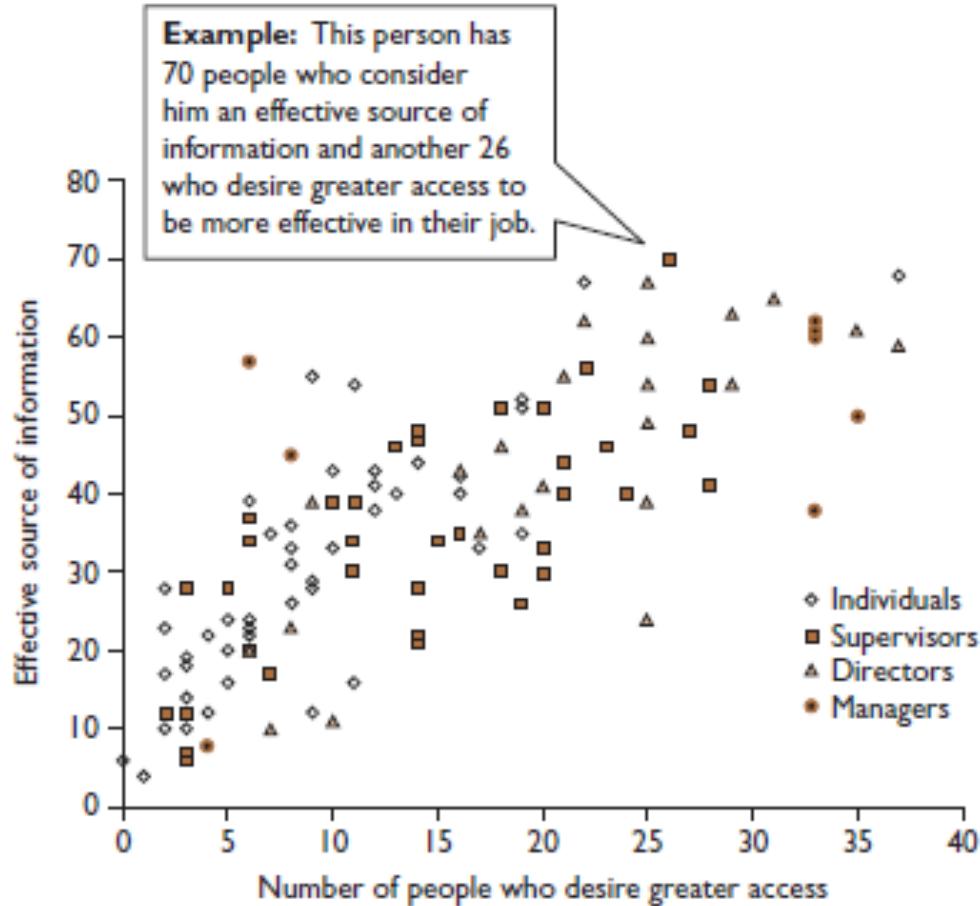
How Can We Improve Collaboration Patterns?

- Is more collaboration needed?
 - More is not always better!
- Where is more collaboration needed?
 - Build ties strategically
- How to increase collaboration?
 - Provide motivation to build ties:
 - Emphasize & promote collaboration
 - Recognize & reward collaboration
- Provide opportunities to build ties:
 - Cross-functional meetings, conference calls, job rotations, site visits, events, etc.

Intervening in Collaboration Networks: Five Examples

1. Reducing employee overload
2. Improving resiliency of global teams
3. Reducing collaboration inefficiencies
4. Eliminating organizational silos
5. Enhancing career paths

1. Reducing Employee Overload by Rebalancing Collaboration Demands



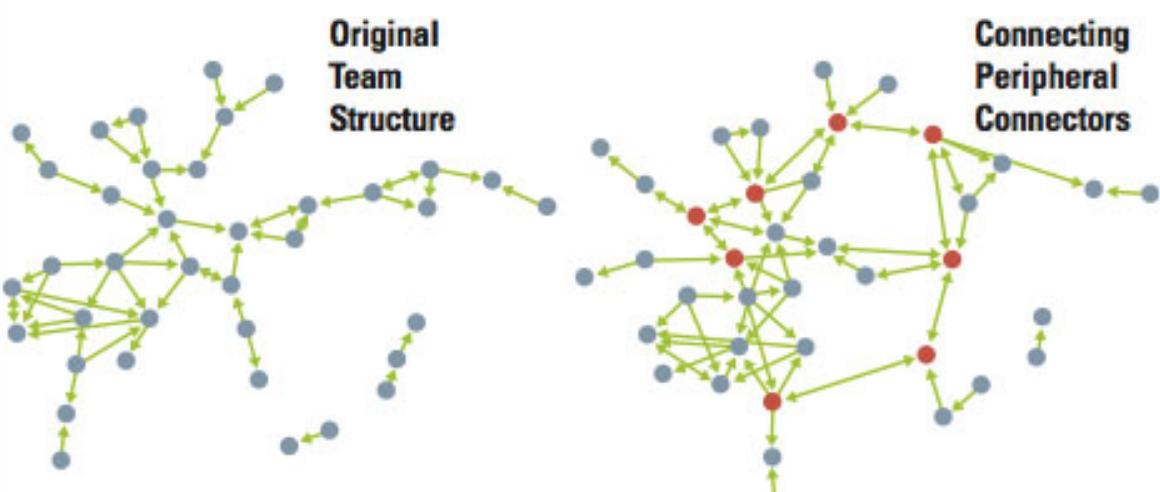
Problem:

- In this **financial services organization** (like many organizations), a network analysis revealed that about 5% of people accounted for up to 35% of the value-added collaborations; these valuable people often felt very overloaded.

Intervention:

- Identify overloaded people (top right corner), and match them with well-regarded employees who are relatively underutilized (often from bottom left corner), who can relieve some of the burden.

2. Improving Resiliency of Global Teams by Connecting Peripheral Members



Source: Cross et al. (2010), MIT Sloan Management Review

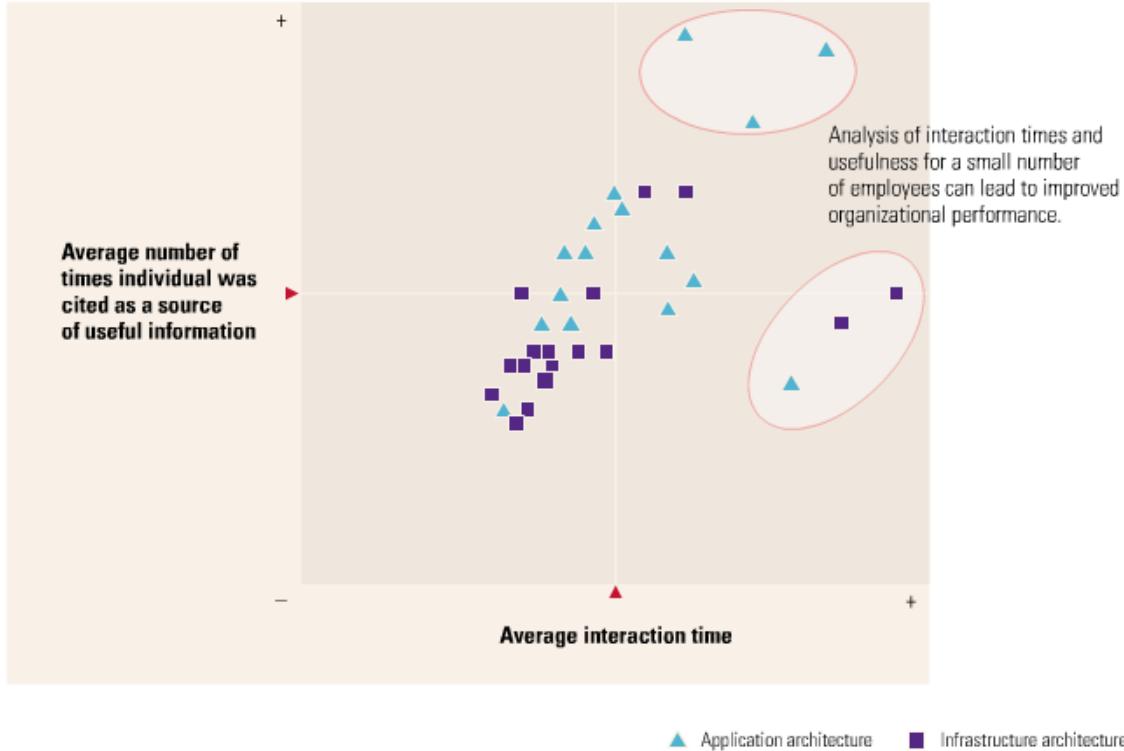
Problem:

- A **multinational agribusiness company** found that its global IT teams often relied on only a few key people to connect their members across the world; [if a few key people left, these teams were vulnerable to breakdown](#).

Intervention:

- Identify a small number of new connections that would have the biggest positive impact on team connectivity, and shift responsibilities more evenly across the members.

3. Reducing Collaboration Inefficiencies Through Targeted Coaching



Source: Cross, Martin & Weiss (2014), McKinsey Quarterly

Problem:

- A major utility company asked employees how much time they spent interacting with each other and how useful those interactions were; the analysis revealed some employees who were very highly regarded, but also a small number of employees who were much less effective than the rest.

Intervention:

- Focus personalized coaching efforts on collaborative issues unique to each of the low performers.

4. Eliminating Organizational Silos by Building Cross-divisional Ties

EXHIBIT 2. Collaboration Across Merged Divisions within a Conglomerate

	Div. 1	Div. 2	Div. 3	Div. 4	Div. 5	Div. 6	Div. 7	Div. 8
Division 1	33%							
Division 2	5%	76%						
Division 3	11%	18%	45%					
Division 4	2%	11%	21%	38%				
Division 5	6%	7%	12%	6%	75%			
Division 6	7%	2%	13%	7%	2%	76%		
Division 7	1%	3%	16%	6%	8%	2%	36%	
Division 8	10%	2%	9%	6%	3%	10%	0%	90%

Source: Cross, Borgatti & Parker (2002), California Management Review

Problem:

- A **Fortune 500 conglomerate** had grown by acquisition, but analysis of collaboration among the top 126 executives revealed that some divisions were much less integrated than others.

Intervention:

- Identify and target network connections that hold most strategic relevance for the firm, and track changes to these ties over time to assess the impact of interventions.

5. Enhancing Career Paths Through Better Performance Management Processes



Source: Cross, Martin & Weiss (2014), McKinsey Quarterly

Problem:

- A **global consulting firm** mapped the networks of about 80 partners, and found two types of collaboration that were very valuable for the firm but not recognized at all in its performance management processes, which focused on individual revenue production:
 - Collaborating to win clients
 - Collaborating to serve clients

Intervention:

- Revise performance evaluation systems to recognize contributions of partners who help others to win new clients or serve current clients

Conclusions



How can we improve
collaboration inside
organizations?

Analyzing Collaboration

- ? How can we describe collaboration patterns between employees?
- ? How can we map these collaboration patterns?
- ? How can we evaluate these collaboration patterns?
- ? How can we improve these collaboration patterns?



Collaboration

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