

# NEW APPROACHES TO MEASURING THE LINKS BETWEEN RESEARCH AND INNOVATION

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# Basics: How do Ideas Spread?

- We focus on people / networks as the transmission vectors for ideas to enter the broader economy
- This approach contrasts on bibliometric approaches focusing on disembodied ideas
  - Like looking for your keys under the light even if it's dim
    - Geographic concentration of industries
    - People go to bricks and mortar schools
    - Travel to be face-to-face

# Big Data: Follow the Money

- Identify graduate students employed on research projects
  - Use STAR / U METRICS data on CIC Universities to identify
  - Research teams (Undergrad, Grad, Postdoc, Staff, Faculty)
  - Purchases
  - Topics
  - Funders
- Use Census data to match researchers to subsequent employers
  - Location, Industry, Size, Age, Growth, Wages
- Match people to publications, grants, patents,...
- Trace flows of ideas from earnings, firm performance, even the areas that firms research

# Establishment of new Institute

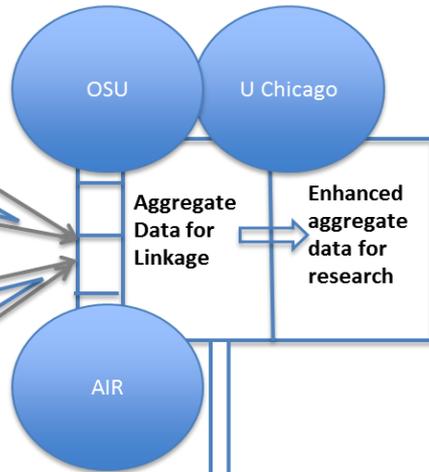
- Institute for Research on Innovation and Science (IRIS) founded 01/01/2015
  - Goal – leverage existing data to both serve university data and generate new research
  - Core facility at University of Michigan
  - 3 years seed funding for infrastructure from Sloan & Kauffman
- Engagement by CIC, AAU and APLU
  - Ongoing engagement with VPRs
  - Links to Federal Statistical Agencies (e.g. Census)

# Operational Structure

Universities contribute data, support infrastructure and receive campus-specific and aggregate products

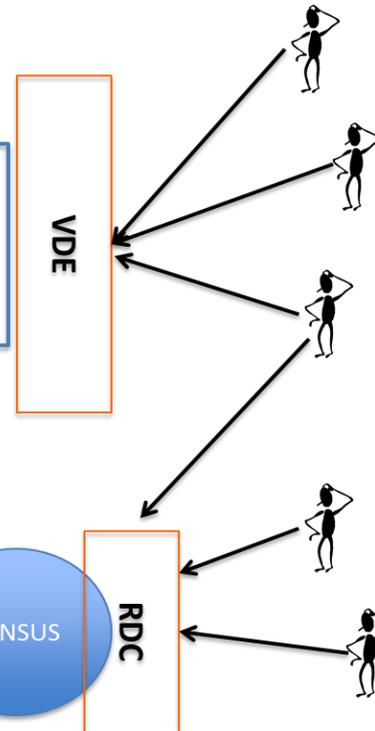


Individual Campus Data "Boxes"

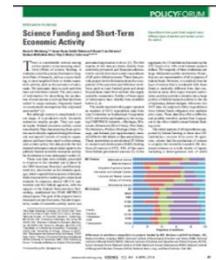
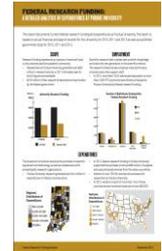


Approved nodes materially improve data, develop research/stakeholder communities

Approved researchers securely access de-identified, aggregate datasets



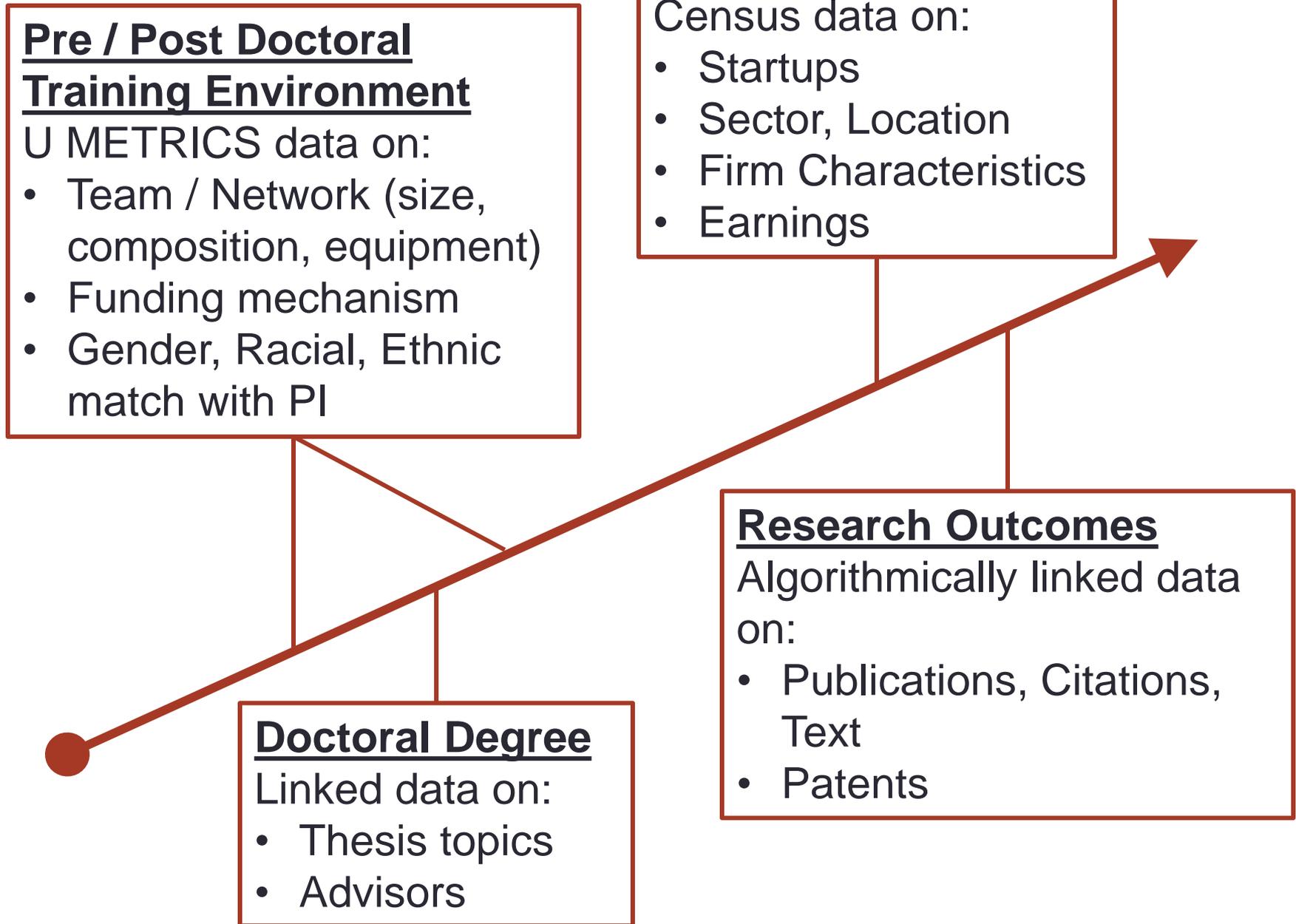
Create New research and reports



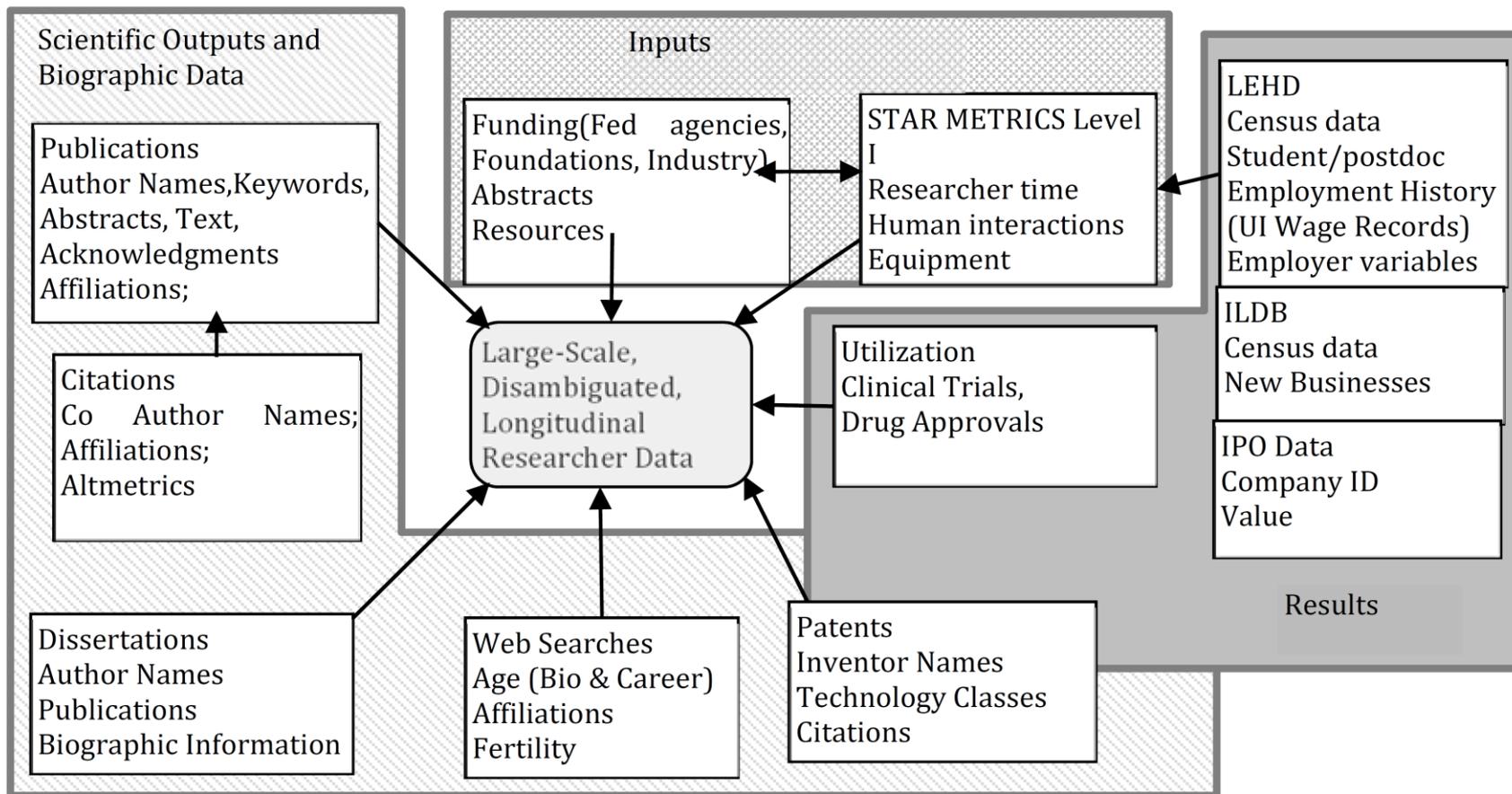
"NPR membership" Model

63 researchers have accessed data

## Figure 2. Career Trajectory



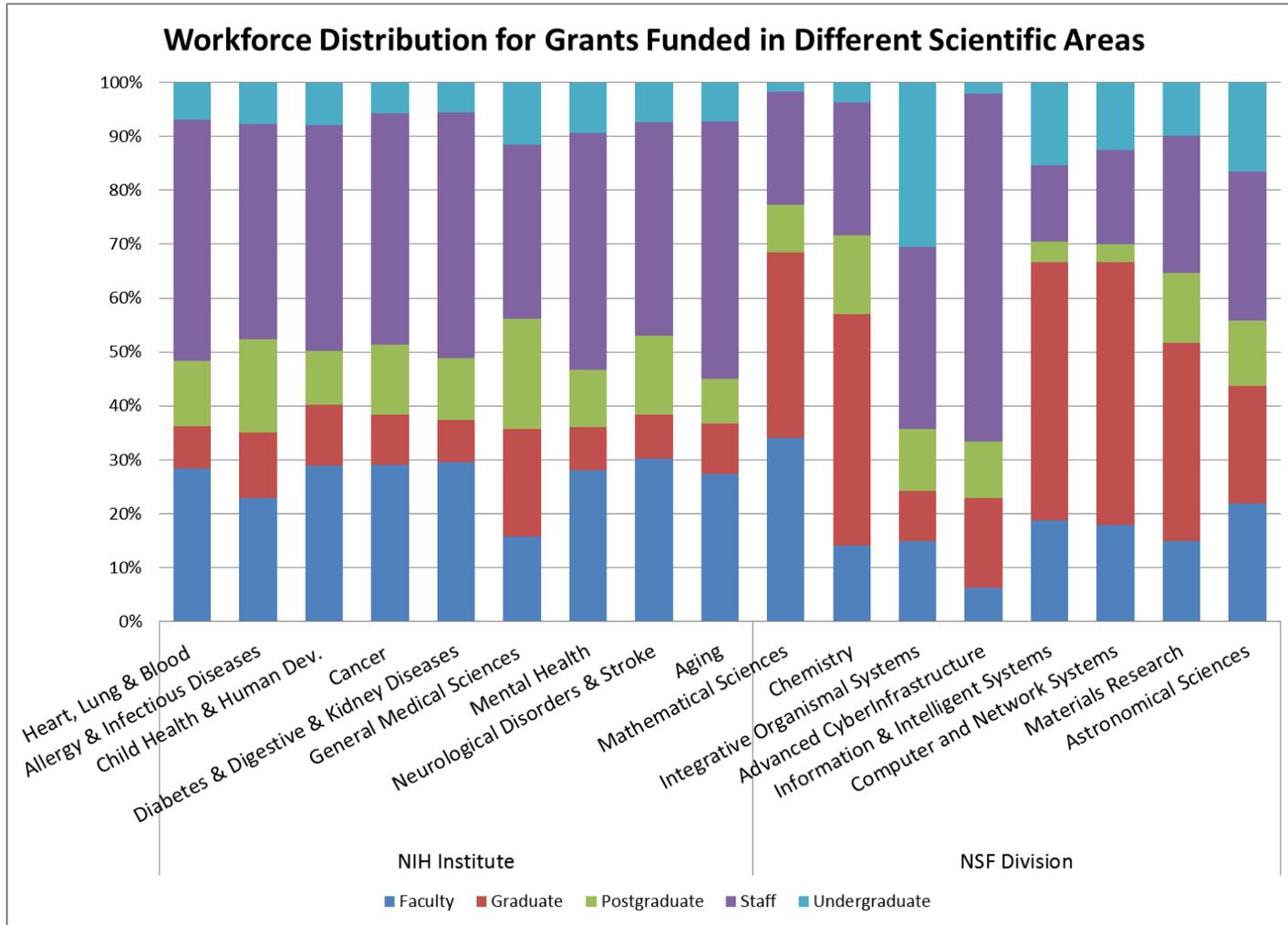
# Data Architecture



# Researcher Characteristics

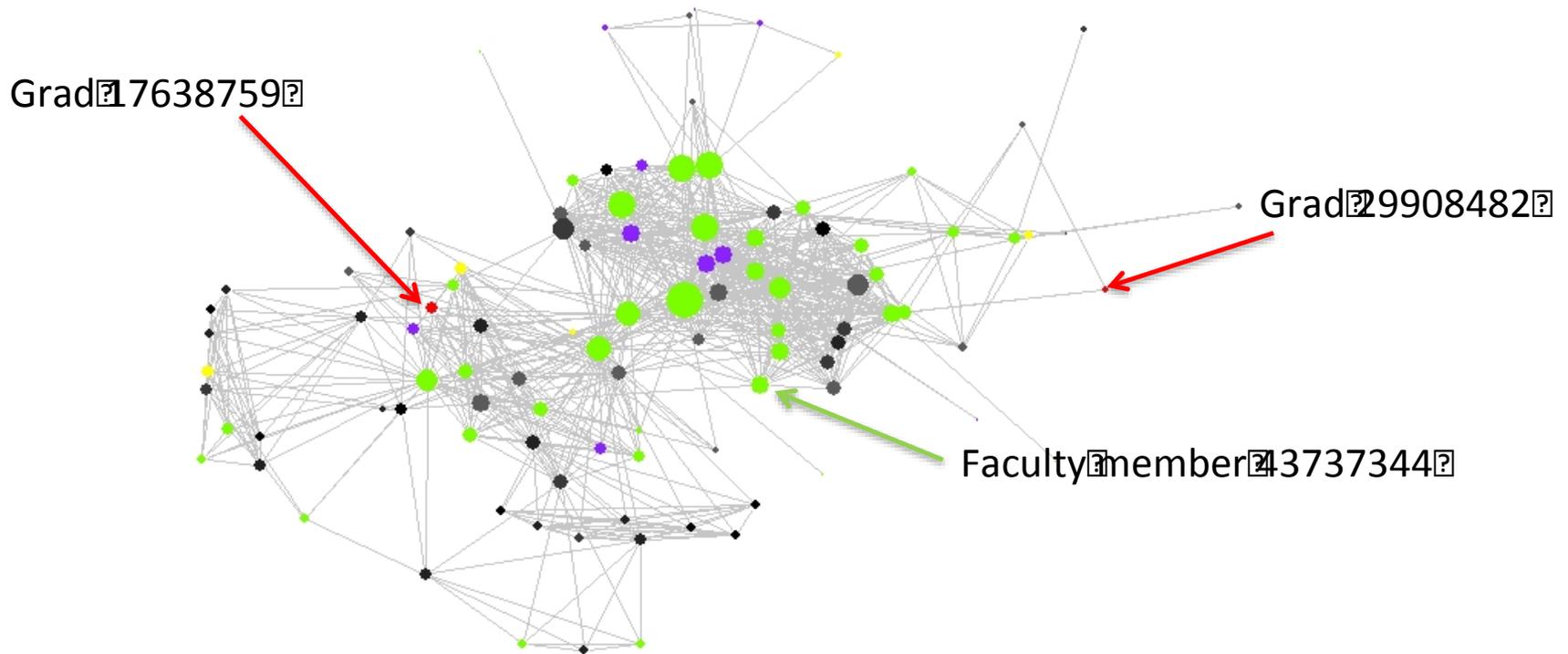
- Data tagged with job titles
- We can link our data to researcher characteristics
  - Gender, Race, Ethnicity, Age, National origin
- Look at how they are related to training environments
  - For instance, my grad student Wei Yang Tham finds
    - Substantial gender concentration on projects
    - Female grad students work on projects with female PIs
    - Female grad students employed on more faculty-intensive projects
- Can look at differences in Placement, Earnings, Firm performance, publications, patenting

# Occupational distribution

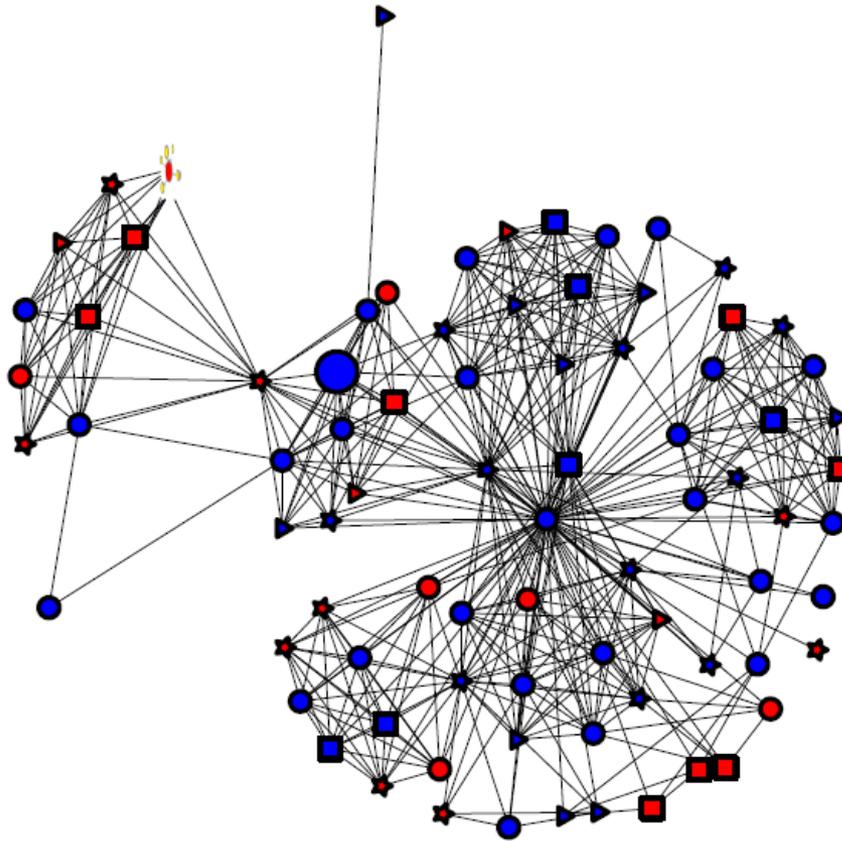


# Analysis of Teams and Networks

Figure 7.3 Sample Walktrip Community



# Gender and Networks



# Purchased Inputs

