

WHITE PAPER



# **Analytics for Change** How Networks and Data Science Will Revolutionize Organizational Change

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## Contents

Organizational Change, Meet Data Science	1
3 Ways Leaders Get Change Wrong	3
Get Change Right: Data + Action	4
Map the Organization's Natural Patterns of Work	5
Match the Change Strategy to the Patterns	9
Maximize Impact of the Change Strategy Leveraging the Patterns	11
Are You Ready for Data-Driven Change?	19
Endnote	20
References and Recommended Readings	20
About the Authors	21

# Organizational Change, Meet Data Science

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Organizations and leaders at all levels are challenged by change. Whether identifying needed changes, responding to changing situations, or implementing multiple change initiatives, leading change is a fraught and complex process.

One reason change is so hard is that no model or set of steps takes into account the unique patterns of interaction in each organization. The ways people naturally work—the informal networks—set the pattern for how change will take place.

If leaders could see and understand the naturally occurring, existing patterns in their organization, they could make better decisions and accelerate change.

*By understanding the patterns of work in their organization, leaders can make real change happen—faster and more naturally.*

## Enter data science.

The age of data is upon us. In all facets of work and life, data science is changing what we know and how quickly we know it. In business, people analytics is making headlines as the next big thing for talent management and organizational effectiveness. For example, Google uses people analytics to identify the attributes of effective leaders, predict the best hires, retain their employees longer, improve diversity, drive collaboration, create successful teams, and increase learning (Sullivan, 2013). Companies across the globe are using data and analytics to understand and leverage patterns in their organization, boosting financial performance.

But data science has yet to burst onto the change management scene—and we argue that it should.

In this paper, we offer an approach to change that does three things:

1. **Maps** the organization's natural patterns of work and social interaction using advanced analytics
2. **Matches** current patterns of work to the changes organizations are trying to implement
3. **Maximizes** success by developing targeted solutions that fit the organization's natural patterns of work and catalyze the network to spur change

# 3 Ways Leaders Get Change Wrong

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Most leaders, managers, consultants, CEOs, researchers, and employees know—on some level—that top-down approaches and traditional change management techniques are not sufficient. Many have tried to engage key people throughout the organization to get traction for change.

This is the right idea and shows good intentions. Even so, these efforts rarely lead to the desired results. Failure typically occurs for three reasons:

## **Failure 1: The “Bring Them All Together” Approach**

Leaders create the time and space for a special event to get as many people as possible to kick off the new initiative, strategy, or process (a “town hall” is common). They offer inspirational speeches and opportunities for employees across functions and managerial levels to interact. The hope is that when everyone hears the same message and the organization shows transparency, the result will be broad engagement and buy-in for the change. But “Bring Them All Together” events have limited impact. They lack permanence and are not connected to real work, commonly referred to as a “one-and-done thing.” Despite providing opportunities for “average” employees to “get involved” or “speak their truth,” big events do not change the day-to-day power dynamics that impact whether change will take place. These events are resource intensive, difficult to replicate, and often do not cascade through the organization to personalize change for all employees.

## **Failure 2: The Subjective “Cherry Picking” Approach**

Another approach is to enlist the influencers in the organization as consistent advocates for a change. In theory, this is great. In practice, it is often poorly executed. Working without relevant data, executives reach out to the people they *think* are influential in the organization. However, people’s network perceptions are not very accurate and get worse when trying to describe the social structure beyond their direct connections (Krackhardt, 1987). Though leaders may think they are picking the best people for the job, in reality they are often cherry picking their favorites. Leaders also tend to overly rely on the few people they view as influential. People are most influenced by those with whom they regularly interact, rather than only a few “super influencers” (Watts, 2011).

## **Failure 3: The “Have Data, but Now What?” Approach**

Some leaders are eager to gather data about their people and their networks, with the expectation that they will then have the information they need for success. However, even with the best data and analysis, leaders need a suite of tools and interventions to help them enact change. Many analytic consultants provide an excellent report about what is wrong, but are unable to offer solutions. This leaves leaders with new and potentially valuable data, but little clarity about what to do next. Or worse, because they have invested in gathering some data, they proceed with an assumption that having data automatically results in a better approach.

# Get Change Right: Data + Action

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How can leaders avoid common mistakes as they bring change to their organizations? What is the right way to engage people throughout the organization in determining and adopting change?

*Organizations that invest in collecting and analyzing the right data and turning their insights into informed actions can successfully implement change and strengthen their collective capacity for continuous change.*

When data and action are rigorously combined, leaders create the conditions for more natural adoption of change.

Our approach incorporates CCL's extensive research and practice in the area of change leadership with data-driven insights regarding how work occurs in each organization. To do so, we draw on research and analytic approaches from three distinct scientific fields:

- **Network Science.** We employ analytic techniques for measuring, mapping, and modeling the patterns of informal relationships in organizations.
- **Social Contagion Modeling.** We use knowledge about peer influence and the spread of ideas and emotions to cascade change in organizations.
- **Workplace Psychology and Social Dynamics.** We incorporate a deep understanding of how leaders and employees function in their workplace to help individuals embrace change.

This data-driven approach helps organizations implement change through employees' natural ways of working. Rather than creating a new model or prescribed steps for change, we help organizations Map, Match, and Maximize the naturally occurring patterns in the organization.

## Map the Organization's Natural Patterns of Work

First, change leaders need to see and understand the patterns of workplace interaction that have an effect on how change takes hold in the organization. Through increasingly sophisticated data collection and analysis processes, we are able to identify and map patterns of work within and across groups. We look at individual and organizational data to measure and track factors affecting information flow, influence, and leadership. With this information, we can better understand the natural patterns of work (i.e., the network structure) and identify people who are structurally positioned to influence the success of a change effort.

The essential question in the mapping stage is:

*What are the patterns of work and social interaction that exist in the organization today?*

To answer this question, we use network analysis and associated statistical methods to identify clusters of connectivity within organizations that represent informal groups, as well as clusters along organizational lines of function, division, and hierarchy. Our data source is typically a customized, web-based employee survey; other sources could include email communications or trace data from web-based communication platforms. One powerful way to visually convey patterns of connectivity and identify people who play key roles is to create maps of the informal network.

**Figure 1. Sample Network Pattern**



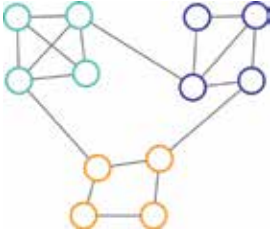
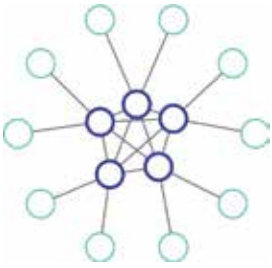
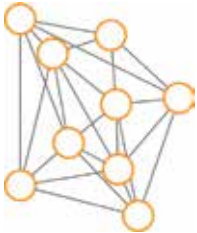
Figure 1 is a simple example of a network map, or diagram. The circles represent people and the lines represent relationships connecting them. A map like this and corresponding analyses show, for example, people in an organization who are central connectors and brokers. Central connectors have ties to many people and act as a “hub” within different parts of the network. Brokers link people who would otherwise be disconnected. They are in the position to transfer and filter information and often act as boundary spanners because their connections form the bridge between different groups in the organizations.

When developing a change implementation strategy, leaders should consider when and how to engage key informal influencers and information-holders who play important roles in how work gets accomplished. These individuals are positioned to be effective change agents.<sup>1</sup> Leaders will also need to understand the readiness of these employees for change and whether they have the interpersonal skills and style to influence their colleagues in a sincere and collegial way.

Individuals’ network position is one part of mapping; another part is seeing overall patterns. Different network patterns reflect different ways of working that have real implications for the ease of implementing different types of change. In this approach, real patterns of interaction are compared to prototypical models (see **Mapping, Matching, and Maximizing Networks for Change** table). With data-driven insight, leaders can see how work gets done in the organization—and start to consider the implications these patterns have for their strategy, goals, and specific change agenda.



## Mapping, Matching, and Maximizing Networks for Change

MAP	MATCH	MAXIMIZE
<p><b>Small World</b></p>  <ul style="list-style-type: none"> <li>• Individuals work in tightly clustered, similar groups.</li> <li>• Cross-cutting relationships connect groups to each other.</li> <li>• Groups are reliant on individuals who bridge clusters as sources of new information.</li> </ul>	<ul style="list-style-type: none"> <li>• Better suited for radical change or innovation: <ul style="list-style-type: none"> <li>- Disruptive changes have an opportunity to develop within pockets of the organization and are thereby “protected” from parts of the organization that may be resistant.</li> <li>- Trusted individuals who connect groups influence whether change spreads.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• For incremental change: <ul style="list-style-type: none"> <li>- Identify boundary spanners who can accelerate the adoption of change through their connections to different groups. Develop their influence skills.</li> </ul> </li> <li>• For radical change: <ul style="list-style-type: none"> <li>- Allow the change to mature (e.g., work out the kinks) before spreading throughout the organization.</li> <li>- Use clusters that have successfully adopted the change to role model and teach others.</li> </ul> </li> </ul>
<p><b>Core-Periphery</b></p>  <ul style="list-style-type: none"> <li>• Individuals in the core are highly connected to each other and tend to be more homogenous in their thinking, attitudes, and behaviors.</li> <li>• Individuals on the periphery have many connections that reach outside the organization and tend to be more diverse.</li> <li>• New information enters from the periphery to the core where it can spread quickly.</li> </ul>	<ul style="list-style-type: none"> <li>• Better suited for incremental change: <ul style="list-style-type: none"> <li>- Changes that enter the core can spread quickly through the many connections individuals have to each other.</li> <li>- There is a natural tendency within the core to preserve the status quo. Changes that are too radical are likely to fail because they are exposed to many naysayers.</li> <li>- Individuals bridging the core and the periphery act as gatekeepers.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• For incremental change: <ul style="list-style-type: none"> <li>- Leverage central people in the core and those who act as gatekeepers between the periphery and core to quickly disseminate the change throughout the organization</li> <li>- Ensure systems and processes reinforce the change.</li> </ul> </li> <li>• For radical change: <ul style="list-style-type: none"> <li>- Create a separate space in the organization where the radical change has an opportunity to be successful.</li> <li>- Form an intentional network to spread change across the organization and convey stories of success.</li> </ul> </li> </ul>
<p><b>Diffuse</b></p>  <ul style="list-style-type: none"> <li>• Overall, fairly low levels of connectivity.</li> <li>• Individuals’ connections tend to not overlap and provide access to different knowledge, which promotes creativity and independent work.</li> <li>• Information may not circulate easily through the organization.</li> </ul>	<ul style="list-style-type: none"> <li>• Better suited for incremental change: <ul style="list-style-type: none"> <li>- Collective action is difficult with this pattern of interaction; change requires “winning over” one person at a time.</li> <li>- There are fewer people in key positions to accelerate the adoption of change.</li> <li>- Organizational groups are not densely connected and tend to overlap making it difficult to focus a change on one group before spreading it to another.</li> <li>- Change spreads when it is clearly superior.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• For incremental change: <ul style="list-style-type: none"> <li>- Ensure organizational leaders explain the superiority of the change and ensure that message gets to every single individual in the organization.</li> </ul> </li> <li>• For radical change: <ul style="list-style-type: none"> <li>- Redesign the organization’s structure and core process to promote the formation of tighter clustering among some organizational groups so that they are less restricted by the norms of the larger organization and can try new things and adopt new behaviors.</li> </ul> </li> </ul>

## A Financial Services Firm: Old Network Hinders New Direction

A financial services company was faced with a drastically changing technical landscape. The firm had been a leader in its core business for over a decade, dominating market share in technology needed to support a form of payment that was becoming obsolete. Concerned that their legacy business would not remain viable, leadership sought to leverage their knowledge, skills, and industry experience in a new financial information management service. They provided a clearly charted path and created a new division that would represent the future of the organization. Despite the focus on the new venture, our analysis revealed that the web of relationships in this organization stubbornly reflected the old ways of

working. Leadership of the old and new ventures worked in silos and many top executives were not connecting with leaders of the new business. Leaders and employees in the new business, who were hired from outside the company for their technical knowledge and expertise, had no access to internal insights from many years of operational success within the core business. Further, the company's top leaders were not directly involved in steering the new venture. With knowledge of the network challenges, the CEO prioritized building cross-business connections as a key element of the change strategy and identified multiple interventions to foster and reinforce new ways of working together.

## Match the Change Strategy to the Patterns

Most approaches to change suggest a universal path to get from “here” to “there.” This does not account for how work actually happens and whether the planned approach for change implementation is capitalizing on or going against the naturally occurring patterns. A better way is to match the type of change with the type of network.

The essential question in the matching stage is:

*Will the current ways of working help us succeed in our planned change or undermine it?*

To answer this, we determine the ideal network structure for implementing the proposed change. Then we build a strategy for implementing change that either leverages the existing patterns (if there is a good match) or evolves the patterns to be more conducive to and supportive of the change.

The ease of implementing change and the best approach for engaging the network in change largely depend on the match between the type of change and the network structure (Battilana, & Casciaro, 2012, 2013; Borgatti, 2005, McGrath & Krackhardt, 2003).

How organizational leaders approach change and what they ask of the people who must ultimately implement the change differs depending on where the change falls on the continuum from incremental to radical.

**INCREMENTAL CHANGES** are relatively small modifications to the existing protocol, procedures, or direction of your organization that build on, rather than disrupt, existing norms and practices. Implementation requires hard work, but these changes are unlikely to create much resistance because they reinforce existing work patterns. In such cases—or when change is simple or clearly superior to existing practices—change approaches that focus on broad, swift dissemination are viable.

**RADICAL CHANGES** are dramatic, transformational shifts in your organization that require employees to learn new information or skills and change established values and practices. Radical changes create more resistance because they break accepted norms and often require people to work together in new ways. Often these changes are complex or controversial—meaning employees are unsure of what the change means for them and whether it is superior to existing practices.

We identify which network patterns are best suited for incremental and radical change and different implementation strategies in the **Mapping, Matching, and Maximizing Networks for Change** table.

## A Premier Nursing School: Network Reality Factored into Change Strategy

Duke University School of Nursing partnered with CCL to identify ways to better focus their people, structure, and processes for greater impact. A key element was an analysis of interaction patterns among all faculty and staff to determine how the network within the school may support—or inhibit—change. The original strategy for change implementation was to identify individuals who occupy key positions in the network as a steering committee that would lead the change effort. However, when our analysis revealed a particular pattern called a diffuse

network, we recommended a shift in strategy. The steering committee would still play a vital role in leading the effort, but this network structure indicated that they could not do it alone. With the way faculty and staff worked together, a few, select voices would not influence the whole; each individual would need to be convinced by those they interacted with most directly. To learn more about the change effort, check out the impact study [Duke University School of Nursing: Leveraging Networks for Change](#).



## Maximize Impact of the Change Strategy Leveraging the Patterns

Knowing which natural work patterns are ready to be used and which need to be nudged to implement change most effectively, leaders can begin working with the network to adopt change. This requires activating or adjusting the network and equipping the people who compose it with the skills and strategies for them to be successful.

The essential question in the maximizing stage is:

*How do we develop the network and individuals to spur change?*

To maximize the results of the mapping and matching phases, organizations need to focus on two specific areas to make change successful.

First, they must intentionally develop change agents to help them use their own connections and existing patterns of work in the organization to implement change.

Second, they need to take targeted actions to rewire the network to better match the desired organizational change.

## Developing Change Agents to Work Via Current Patterns

Change agents are (in part) chosen because they occupy key positions in the organizational network, which regardless of their formal hierarchical role, position them to be effective change agents. When implementing change, network knowledge and know-how go a long way. Change agents need to understand the way the organization works informally and the implications of these patterns of working for implementing change. Change agents also must understand and activate their own personal network if they are to be effective in spurring change.

Recent research by Battilana and Casciaro (2012, 2013) found that effective change agents identify and engage stakeholders skillfully and influence effectively through their personal networks.

**Engaging Stakeholders.** Battilana and Casciaro explain that change agents need to consider the change readiness of the key stakeholders around them. Are they supporters, fence-sitters, or resisters? When change agents understand the level of support, they are able to tailor their communication and choose where to invest their energy. Change agents should engage supporters of the change, focus the majority of their attention on fence-sitters, and address resisters with care—an approach summarized in Figure 2.

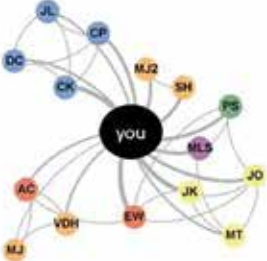

**Figure 2. Approaching Change Supporters, Fence-Sitters, and Resisters**

SUPPORTERS	FENCE-SITTERS	RESISTERS
<ul style="list-style-type: none"> <li>• Seek advice for improving the change.</li> <li>• Ask for introductions to others who should be involved in the effort.</li> <li>• Limit time investment (they are already on board).</li> </ul>	<ul style="list-style-type: none"> <li>• Find out why they are hesitant about the change.</li> <li>• Develop deeper personal relationships to help increase buy-in.</li> <li>• Invest time to ensure they don't jump to the resisters' side of the fence.</li> </ul>	<ul style="list-style-type: none"> <li>• Listen; Ensure they feel heard and have input.</li> <li>• Don't provoke; Negative voices can quickly become too loud.</li> <li>• Manage strong personal relationships so they don't make change more difficult.</li> </ul>



**Activating Personal Networks.** Battilana and Casciaro’s work also points to the need for change agents to understand the structure of their own personal network, specifically whether it is “opened” or “closed” and how that network impacts the ease with which they can implement certain types of change. Then, they can determine if they are well-positioned to spread change or if they may need to partner with others whose network may be better suited for the change at hand. Figure 3 summarizes how these personal network patterns support different types of change.

**Figure 3. Change Agent Networks**

<p><b>TYPE</b></p>	 <p><b>Open</b> People you know are disconnected or clustered into separate, distinct groups.</p>	 <p><b>Closed</b> People you know tend to know and communicate with each other.</p>
<p><b>BENEFITS</b></p>	<p><b>Control</b> You are the link between others and have control over what, when, and how you transfer information. This allows you to vary the timing of messages about change and frame those messages differently for specific groups of contacts.</p>	<p><b>Trust</b> Everyone around you knows what others say and do, creating high levels of trust. People in your network are predisposed to trust your intentions, which is helpful when persuading others.</p>
	<p><b>Separation</b> The separation between groups of contacts also makes it less likely that resisters will form a coalition, which is very helpful when the change is viewed as more disruptive or radical.</p>	<p><b>Coordination</b> The many connections between contacts make it easier to communicate and coordinate everyone. Those who are resistant to the change will likely feel pressure to conform, especially if the change is not viewed as disruptive.</p>
<p><b>MATCH</b></p>	<p><b>Radical Change</b></p>	<p><b>Incremental Change</b></p>





## Targeted Actions to Rewire Current Patterns to Align with the Change Initiative

Some changes require a rewiring of the network to be successfully implemented. There are three broad approaches to help redefine patterns of work and social activity in organizations.

**Restructure the Physical Environment.** Geographic proximity and the physical design of workplaces have a large impact on patterns of interaction (Allen & Fustfeld, 1975; Sailer & McCulloh, 2012). A famous example of this principle in action is how Steve Jobs designed the Pixar offices upon acquiring the company. A large atrium was created at the center of the building to hold everything people might leave their offices for, including coffee, food, and even the only set of bathrooms in the building. The point was to create serendipitous interactions between people from different parts of the company by increasing the likelihood that they would cross paths and talk to each other daily. This move has been credited in part for driving the company's creativity and success, and the general philosophy has been adopted at many organizations. Altering the placement of common space and altering physical structures is one way to nudge network patterns toward effective forms that support collaboration, innovation, and productivity. For another example of this approach in action, see the impact study: [Merrimack Pharmaceuticals: A Story of Transformation](#).

**Redesign the Formal Structure and Processes.** Formal work processes also have a large influence on patterns of workplace relationships. Sometimes formal structures and processes can stifle creativity, create bottlenecks, and reinforce silos. It is critical that organizations ensure that their formal structure and processes are working in harmony with emergent, natural patterns of interaction. Informal work relationships exist to supplement or work around the organization's formal structure. For changes to be successful, leaders need to ensure that formal structure and processes are aligned with the change and are working in concert with the organization's informal dynamics.

**Building a Strategic Change Network.** Sometimes organizations need people to form new network connections to make the change a reality. Some changes, especially transformative ones, require change agents to bring together individuals from across the organization. This approach is also useful when the problem driving a change, but not the solution, is known. Change agents build intentional networks by identifying and connecting individuals and groups, who may not know each other and do not work together, to achieve the desired change or spur collective action. (See the white paper [Transformational Change: An Ecosystem Approach](#).) As these networks grow, the type of skills change agents need will change as well. Leadership development efforts can help change agents develop these skills.

See the **Mapping, Matching, and Maximizing Networks for Change** table for more examples of targeted actions organizations can take to maximize change.

## **A Global Consumer Goods Producer: Change Agents Develop Network Know-How**

A large global producer of consumer goods had experienced stable success reflected in their brand recognition and market penetration. But the organization's past success had not prepared its employees to execute large-scale change. They never had to. Now facing rapid changes in consumer attitudes and behaviors and new regulatory requirements, change was essential. We worked with cohorts of change leaders developing the perspective and skills they would need to spread the most important changes across the organization. Many of these individuals were hard drivers and thought, "If I just work hard

enough, everyone will get on board with this change." We helped them see why they needed to work with others differently and not go it alone. They began to see a need to "rewire" the organization, starting with their own connections. With an understanding of organizational patterns of work and their personal networks, they learned strategies for approaching different types of stakeholders. The organization found that these development efforts increased speed of change adoption, resulted in cost savings from implementation efforts, and helped individuals be more effective as change agents and in their everyday work.



## Are You Ready for Data-Driven Change?

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The right data paired with the right development can change the way organizations implement change.

By mapping patterns, matching the network to the need, and targeting interventions where they will have the greatest impact, people throughout an organization are better able to understand, lead, and enact change. Through this approach, organizations open the door to a more effective, efficient change process and build capacity for future changes. By tapping into the power of networks and data science, leaders can make real change happen—faster and more naturally.

# Endnote

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<sup>i</sup> Engaging informal influencers is a guiding principle in network interventions and has demonstrated substantial impact for spreading healthy behaviors and the adoption of medical innovations (Contractor, & DeChurch, 2014; Valente, 2012).

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