

Solutions for Enabling Lifetime Customer Relationships.

# Sphere of Influence

The Importance of Social Network Analysis

WHITE PAPER:

SOCIAL NETWORK ANALYSIS



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## ABSTRACT

THE RAPID GROWTH OF CONSUMER DATA, COMBINED WITH THE EXPANDING IMPACT OF SOCIAL MEDIA, HAS CREATED A NEED TO BETTER UNDERSTAND WHICH DATA IS MEANINGFUL. THIS IS POSSIBLE ONLY WHEN DATA IS CONSIDERED IN THE CONTEXT OF THE NETWORKS WITHIN WHICH DATA IS SHARED. CONSIDERATION OF HOW PEOPLE ARE CONNECTED TO OTHER PEOPLE, PLACES AND THINGS HELPS DEFINE THEIR SPHERE OF INFLUENCE AND CAN PROVIDE INCREASED INSIGHTS AS TO THE NATURE AND IMPORTANCE OF TRANSACTIONS THEY CONDUCT.

THIS PAPER INTRODUCES THE BASIC CONCEPTS ASSOCIATED WITH SOCIAL NETWORKS, DESCRIBES ITS ADVANTAGES AND APPLICATIONS, AND CLOSES WITH A DISCUSSION OF THE CRITICAL DATA AND ORGANIZATIONAL PREPARATION REQUIRED TO LEVERAGE SOCIAL NETWORK ANALYSIS (SNA). EVEN IF YOU'RE NOT READY TO IMPLEMENT SNA TODAY, IT'S VITAL THAT YOU BEGIN THE PROCESS OF "FUTURE-PROOFING" YOUR DATA GATHERING AND STORAGE STRATEGIES.

# IT'S NO LONGER SUFFICIENT TO EVALUATE A CUSTOMER'S LIFETIME VALUE (LTV). INSTEAD, CONSIDERATION MUST BE GIVEN TO A "CUSTOMER'S NETWORK NET WORTH."

## Introduction to Social Networks

Analyzing consumer behavior has traditionally focused on who they are (age, gender, income, religion) and what they do (inquiries, purchases, ratings). For example, credit card companies detect unusual transactions based on purchase patterns: amount, frequency, location, and category. Marketers rank customers for potential promotions primarily by what they have bought before. These techniques were – and still are – quite effective.

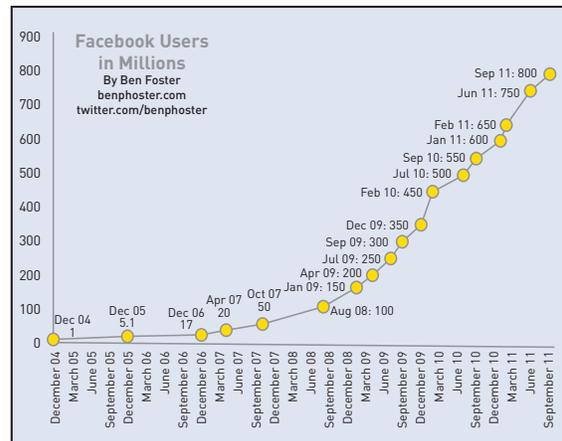
But notably lacking has been consideration of how individuals (or organizations) are connected to people, places and things that can provide increased insights as to the nature and importance of the transactions as they occur.

Common Defining Elements of Social Networks	
<ul style="list-style-type: none"> <li>• People you know                             <ul style="list-style-type: none"> <li>&gt; Friends</li> <li>&gt; Family</li> <li>&gt; Business associates</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Things you do                             <ul style="list-style-type: none"> <li>&gt; Purchases</li> <li>&gt; Online site visits</li> <li>&gt; Behaviors</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Places you go                             <ul style="list-style-type: none"> <li>&gt; Shopping</li> <li>&gt; Travel</li> <li>&gt; Service providers</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Common bonds                             <ul style="list-style-type: none"> <li>&gt; School Alumni</li> <li>&gt; Clubs</li> <li>&gt; Activities</li> </ul> </li> </ul>

## Increasing Rate of Information Growth

The rapid growth of consumer data combined with the expanding impact of social media provides both opportunity (richer insights) and peril (information overload). In particular, social media is geometrically increasing the rate of information growth. Facebook users have grown from zero in 2004 to more than 800 million today – with no evidence of a diminishing growth rate. Social CRM is deepening existing relationships and generating yet more data. These relationships are redefining the overall view of the consumer. It's no longer sufficient to evaluate a customer's lifetime value (LTV). Instead, consideration must be given to a "Customer's Network Net Worth."

This raises important issues about how to select, process and store information.



Key findings from Nielsen's "State of the Media: The Social Media Report - Q3 2011":

- Social networks and blogs continue to dominate Americans' time online, now accounting for nearly a quarter of total time spent on the Internet
- Social media has grown rapidly—today nearly 4 in 5 active Internet users visit social networks and blogs
- Americans spend more time on Facebook than they do on any other U.S. website
- Close to 40% of social media users access social media content from their mobile phone
- Social networking apps are the third most-used among U.S. smartphone owners
- Internet users over the age of 55 are helping to drive growth of social networking through the Mobile Internet

## What is a Social Network?

A social network is comprised of people (or organizations) connected by friendship, kinship, common interest, beliefs, and financial exchange – among many other things. These relationships are often displayed in a diagram, where entities are the points (also called nodes) and connections are the lines. Social networks operate on many levels, from families

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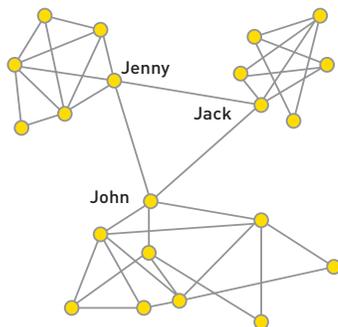
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and nations—and play a critical role in determining the way decisions are made and organizations are run.

There is some basic terminology used to describe social networks that might help you better understand them:

**Centrality** measures one’s impact, based on how well s/he “connects” other members of the network. It’s not just about who has the most connections, but also where those connections lead to, and how they connect the otherwise unconnected.

**Betweenness** represents the number of people connected indirectly through an individual’s direct links.



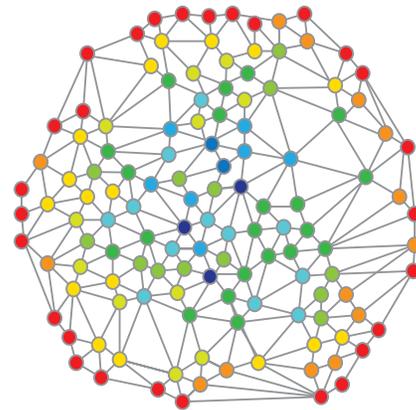
**Closeness** measures the extent to which an individual is near all other individuals in a network (directly or indirectly). It reflects the ability to access information through the “grapevine” of network members.

**Degree** is the number of links to other people in the network. Stanley Milgram’s well-known experiments provided insight as to the average number of links it takes to connect individuals.<sup>1</sup>

## Key Relationships Revealed by Social Network Diagrams<sup>2</sup>

Network diagrams reveal the interactions and structure of people in groups. The figure on the left depicts a simple network with three examples of the common positions people play in it.

**Central connectors** are the people that exert significant

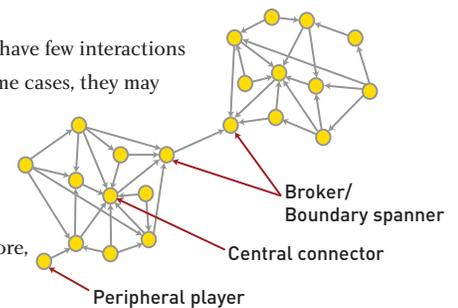


Hue (from red=0 to blue=max) shows the level of betweenness.

influence over the network. In many cases, they are the “go to” people, but they also might be a bottleneck in the information dissemination process.

Brokers, sometimes called boundary spanners, are the people that connect disparate groups. They are often a source of innovation since they serve as a connector to the other people a cluster typically does not interact with.

Peripheral players are people who have few interactions with the rest of the network. In some cases, they may even be outliers with no regular contact to others in the cluster. However, peripheral players may have connections outside of the organization’s network and, therefore, be an additional source of new insight.



## Advantages of Social Network Analysis

Social Network Analysis (SNA) is emerging as a valuable tool in predicting and influencing consumer behavior. SNA differs from traditional social scientific studies, which assume that it is the attributes of individuals that matter most. SNA produces an alternate view, where the attributes of individuals are less important than their connections with others. Thus, SNA allows

## FINANCIAL INSTITUTIONS ARE FINDING THAT SNA IS HELPING TO REVEAL 20 TO 50 TIMES MORE FRAUD.

you to gain insights into non-obvious relationships between people, places and things.

This represents an order-of-magnitude increase in the ability to evaluate consumer behavior and identify individuals who demonstrate a strong ability to influence others, otherwise known as their sphere of influence. The technology now exists to process huge amounts of data, making it possible to analyze network data from numerous sources.

Keep in mind that SNA is just one tool that can be used to understand consumer behavior. Others include anomaly detection, predictive analytics and rules-based analytics.

### APPLICATIONS OF SOCIAL NETWORK ANALYSIS

Social Network Analysis has already been used in a number of areas, primarily focused on criminal activities. It turns out that examining people's acquaintances and affiliations can be valuable in uncovering fraud including credit card theft, insurance scams, health care abuse, and insider trading. According to Dan McKenzie, Fraud Solutions Specialist at SAS Canada, financial institutions are finding that SNA is helping uncover 20 to 50 times more fraudulent activity than had been the case before SNA was used.<sup>3</sup> Fraud is difficult to spot, because the incidents are often buried within huge amounts of normal activity. Further, the activities often seem normal in isolation.

Gaining less attention, at least so far, are applications of SNA in the areas of marketing: improving brand awareness, acquiring new customers, and doing a better job of keeping existing customers. These, too, have significant potential to improve your bottom line.

#### Improved Customer Targeting

Traditionally, marketers rank their customers for potential promotions based on their past purchase history. The most basic variables are recency, frequency and value of purchases. More sophisticated models include demographic, geographic and psychographic variables, as well as variations of the basic purchase variables.

Applications of SNA	
<b>Preventing Negative Activity</b> <ul style="list-style-type: none"><li>• Combat terrorism</li><li>• Identify crime patterns</li><li>• Detect insurance scams</li><li>• Break fraud rings</li></ul>	<b>Enabling Positive Developments</b> <ul style="list-style-type: none"><li>• Identify brand ambassadors and subject matter experts</li><li>• Increase quality customer acquisition</li><li>• Improve retention, reduce account churn</li><li>• Develop organizational expertise and leadership</li><li>• Optimize research and development efforts</li></ul>

But now imagine bringing sphere of influence into the picture. This might take the form of an "influence factor" that would represent the probability of buyers driving additional purchases through their network connections. A customer who is linked to other customers is more likely to purchase again. How much more depends on the specific industry and business. The integration of social network variables can generate enormous increases in response to retention campaigns.

Marketing applications of social network data include the following:

- Best next-offer to customers
- More targeted acquisition campaigns
- More relevant retention campaigns
- Development of marketing automation efforts

#### Brand Ambassadors

How do you find brand ambassadors? It's not difficult to characterize them. They are typically loyal customers who are vocal, active and passionate. They are respected and tend to be in professions that require networking.

But finding them is not always easy. Social Network Analysis is well suited to this problem, given the rapid growth of blogs, social

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media sites, and other social platforms. Enormous sources of data are being created about your customers and prospects. You can learn what they think and who is listening to their opinions. These insights can be used to identify new product opportunities, optimize pricing, and improve customer service.

### Reducing Account Churn

A fundamental business operating principle holds that retaining a customer is much less costly than acquiring a new one. If you work in the Telecommunications industry, for example, you have your work cut out for you. Annual churn rates in the prepaid segment average from 50 to 70 percent.<sup>4</sup> So even small percentage reductions can translate into millions in saved profit. And these “saved” subscribers may help decrease churn within their own social networks, resulting in even more savings.

Data elements will be unique in every industry. In the telecommunications example cited above, firms can leverage existing internal usage data from the customer's call detail records, such as who they call and how often. Evaluating this data can provide insights toward offering the central connectors special rewards or other customized experiences. Noteworthy is that this can be accomplished without relying solely on external social network data.

The bottom line: integrating internal and/or external network variables into traditional predictive analysis models can dramatically increase their effectiveness.

### Terrorism

Terrorist groups are typically decentralized structures comprised of loosely connected individuals. They typically operate “under the radar.” Social Network Analysis has become an integral tool to uncovering terrorist threats, with investigations typically proceeding along the following lines:

- Suspects are identified
- Daily activities can be used to uncloak their network:
  - > Who they call / email
  - > Who visits with them locally and in other cities
  - > Where their money comes from

- Direct connections are identified
- Connections of connections are identified
- Key individuals in the network begin to stand out and are investigated more closely.

Additionally, the characteristics of network organizations can be used to determine the likelihood and impact of terrorist activity – such as ideology, size, age, networking activity, leadership.

### Health Care Fraud<sup>5</sup>

The National Health Care Anti-Fraud Association estimates conservatively that 3% of all health care spending – or \$68 billion – is lost to health care fraud. The fraud typically results from the following:

- Billing for services not actually provided
- Billing for a higher reimbursable service than was actually performed
- Performing unnecessary services
- Combining personal expenses with medical claims
- Receiving kickbacks for referred patients

Social Network Analysis can be used to detect patterns, establish linkages between individuals, and connect non-obvious relationships. SNA can help health care payers, government agencies, and law enforcement investigate and reduce fraud. Here's how:

- Determine if patients have relationships with fraudsters
- Investigate inappropriate relationships between patients, employees, suppliers and partners
- Identify possible payer employee associations with fraudsters

### PREPARING TODAY FOR TOMORROW

Social Network Analysis is still in its infancy, but its adoption is growing quickly. So even if you're not ready to implement SNA today, it's vital that you begin the process of “future-proofing” data gathering and storage strategies. Otherwise, you could find yourself at a serious competitive disadvantage in just a few years.

## Data Considerations

One of the greatest challenges to implementing Social Network Analysis is coping with the sheer amount of data. Every day we create 2.5 quintillion bytes of data—90% of which has been created in the last two years alone. Your own customer database is growing through acquisition and increased insight into existing customers. If you can't make sense of the growing amount of data you have today, how will you manage it tomorrow?

Here are some other data-related challenges to consider:

- Only exists for specific individuals or households
- Siloed by line of business, department or agency
- Inaccurate or incomplete (leading cause of CRM failure)
- Inaccessible (network linkages)

One thing is for certain: you don't want to sign off on a master data management (MDM) approach today that fails to organize data around customer network interactions. Here are some specific guidelines to follow:

- Design your MDM structure to accommodate network data
- Manage data so it can be used across the enterprise
- Standardize, parse and cleanse unstructured data
- Identify and consolidate duplicates
- Enrich data with demographic and location info

The foundation of good, quality data must be clearly defined and established – so segmentation, marketing and customer experience can be maximized.

## Organizational Considerations

In order to implement a future-proof MDM structure, you'll need to have a supporting organizational structure. This means getting people out of their silos and communicating the importance of integrating both individual business transactions and network interactions. This might require having employees wear different hats and communicate across business functions.

This education must be supported by senior management and financed by appropriate investments in appropriate technology.

## SUMMARY

Organizations will increasingly be looking to ways to understand, identify and exploit network relationships to achieve specific business goals. Even if you are not ready to consider Social Network Analysis today, you need an approach to MDM now that will provide for these benefits when you are ready.

- Growth in consumer information is increasing daily, driven by social media
- SNA vastly improves predictive analytics and other techniques
- SNA may be applied to many areas of business
- SNA is becoming a competitive necessity
- Proper data management is a critical requirement

Pitney Bowes Software is uniquely positioned to help organizations prepare for this new discipline. With expertise in data management, data integration, location intelligence and predictive analytics, Pitney Bowes Software is already helping corporations and government agencies lay the groundwork for advanced network analysis. To learn more about these solutions, including our Spectrum™ Technology Platform and new Network Analysis module, please call 800-327-8627 or visit [pb.com/software](http://pb.com/software).

<sup>1</sup>Stanley Milgram, "The Small World Problem," *Psychology Today*, May 1967.

<sup>2</sup>Gartner, August 2008.

<sup>3</sup>The Globe and Mail, "Banks fight fraud with new social networking weapons" by Lynn Greiner, 2/14/11.

<sup>4</sup>A NimzoSTAT White Paper, "Social Network Analysis: Decrease Churn Rate at Telecom Operators" by Rudy Jacob, Philippe Kerremans, March 2010.

<sup>5</sup>"Social Network Analysis: A Prescription for Reduced Fraud," by Clarence Hempfield, Pitney Bowes Software, 7/26/11.

<sup>6</sup>"You Have My Data: Please Use It" by Navin Sharma, Pitney Bowes Software, 9/15/11.



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