White paper

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Customer Information Management

Customer Analytics

Sphere of influence

Understanding the dynamics of social connections among people and organizations is a critical strategic advantage.

Social "capital" and network "net worth"

How people are connected to other people, places and organizations helps define their "sphere of influence." Social Network Analysis (SNA) has become a tool to predict and influence consumer behavior. Traditional analysis assumes that it's the attributes of individuals that matter most. In SNA, personal attributes are less important than connections with others. By determining the extent of individuals' *social capital* and *network net worth*, SNA gives you insights into unexpected relationships between people, places and things. How can you align your analysis, data management and storage capabilities for SNA?

The unrelenting growth spurt in social (and mobile-social)
Key findings from Nielsen's *2014 Digital Consumer Report*:

- Facebook remains the dominant social network, but social users are also embracing LinkedIn, Pinterest and Instagram, which all saw significant usage spikes.
- The social phenomenon continues to grow, with 64% of social media users visiting social networks and sites from their computer every day.
- The explosion in social mobile access by smartphone is even more dramatic: 47% of device owners visit social media sites daily, while social site visits increased 26% through smartphone web browsers and 37% via smartphone apps.

Traditional analysis tells us who bought or will buy. Social network analysis helps us understand why.

Measuring social and individual aspects of consumer behavior.

Analyzing consumer behavior traditionally focuses on who they are (age, gender, income, race or ethnicity, religion) and what they do (inquiries, purchases, ratings). For example, credit card companies detect and flag unusual transactions based on purchase patterns: amount, frequency, location and category. Marketers rank customers for potential promotional campaigns primarily by what they've bought before.

Although techniques are still very effective, social network analysis (SNA) adds an additional layer of analysis that measures how individuals (or organizations) are connected to people, places and things. This *social* consideration offers insights about the nature and importance of transactions as they occur.

The rapid proliferation of consumer data, expanding impact of social media and embrace of this new paradigm in behavioral analysis provide both opportunity (richer insights) and peril (information overload).

Social media is geometrically increasing the rate of information growth. Facebook's monthly active users have grown from zero in 2004 to more than 1.4 billion today—a number equal to the population of the People's Republic of China.

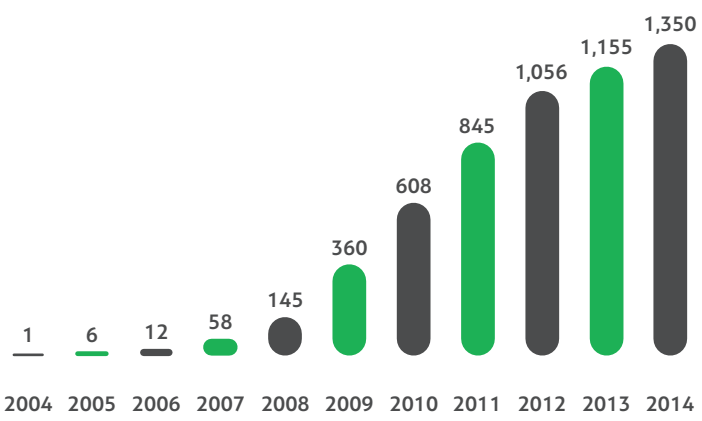
Social CRM is deepening existing relationships and generating yet more data. These relationships are redefining the overall view of the consumer. It's no longer sufficient to evaluate a customer's lifetime value (LTV). Instead, consideration must be given to a customer's influence, "social capital" and network "net worth."

This raises important issues about how to select, process and store the information needed for social media usage and social network analysis.

Common defining elements of social networks

People you know • Friends • Family • Business associates	**Things you do** • Purchases • Online site visits • Behaviors
Places you go • Shopping • Travel • Service providers	**Common bonds** • School Alumni • Clubs • Activities

Facebook MAUs (in millions)
Facebook has 1.35 billion monthly active users (MAUs) as of Q4 in 2014.



Conceptualizing social network analysis

A social network is comprised of people or organizations. They're connected by friendship, kinship, common interest, beliefs, and financial exchange, among many other things. These relationships are often visualized in diagrams where people and organizations are shown as the points (or "nodes") and connections are the lines. Social networks operate on many levels and play a critical role in determining the way decisions are made and organizations are run.

The basic terminology used to describe social networks lets us better understand them:

Centrality measures someone'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.[1]

Network diagrams reveal the interactions and structure of people in groups. Figure 01 depicts a simple network with three examples of the common positions people play in it.

Central connectors (see Figure 03, and the blue connectors in Figure 02) are the people that exert significant 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.

Figure 01

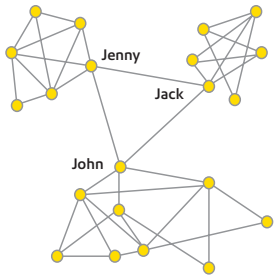
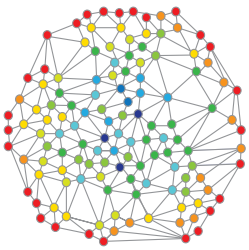
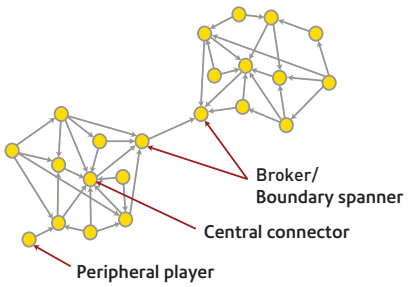


Figure 02



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

Figure 03



Brokers, or boundary spanners, are the people that connect disparate groups. They are often a source of innovation, because they serve as a connector to people with whom a cluster might not typically interact.

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 and applications of social network analysis

Social network analysis is just one tool for understanding consumer behavior (others include anomaly detection, predictive analytics and rules-based analytics). But it represents an order-of-magnitude increase in the ability to evaluate behavior and identify individuals able to influence others. We're more able to identify those people with the broadest and most powerful sphere of influence. The technology now exists to process huge amounts of data, making it possible to analyze network data from multiple sources.

SNA has already been used in a number of ways. One of its earliest primary focuses was crime solving. Examining a suspect's acquaintances and affiliations can be highly valuable in uncovering fraudulent activity like credit card theft, insurance scams, health care abuse and insider trading.

Fraud was traditionally difficult to spot because incidents are often buried within huge amounts of normal activity, and fraudulent acts often seem normal in isolation. But, according to Dan McKenzie, fraud solutions specialist at SAS Canada, financial institutions have learned that SNA is helping them to uncover 20 to 50 times more fraudulent activity since its advent and use.[2]

Better customer and prospect targeting

Perhaps most promising, however, are SNA's marketing applications: improving brand awareness, acquiring new customers and doing a better job of keeping existing customers. These have significant potential to improve your bottom line.

Traditionally, marketers rank their customers for cross-selling or promotional campaigns based on 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.

An understanding of sphere of influence has implications on entire communities of potential customers. Rankings like "influence factors" represent the probability of buyers driving additional purchases through their network connections. A customer who's linked to other customers is more likely to purchase again. How much more likely depends on the specific industry and business. The integration of SNA variables can generate enormous increases in retention campaign response.

Other marketing applications of social network data include:

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

Identifying and nurturing brand ambassadors

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

1"The Small World Problem," Psychology Today, Stanley Milgram (May 1967)
2"Banks fight fraud with new social networking weapons," The Globe and Mail, Lynn Greiner (2/14/11)

Finding them is not always easy. Social network analysis is well suited to this problem, given the rapid growth of blogs, social media sites and other social platforms. Enormous databases have been created about customers and prospects. You can learn their relative social capital and network net worth (through basic scores and influence ratings as well as your own analysis of online metrics). You can learn what they think and who's listening to their opinions. You can use these insights to identify new product opportunities, optimize pricing and improve customer service.

A fundamental business operating principle holds that retaining a customer is much less costly than acquiring a new one. If you work in telecommunications, for example, you know that you have your work cut out for you. Annual churn rates in the prepaid segment average from 50 to 70 percent.[3] Even small percentage reductions can translate into millions in saved profit. These "saved" subscribers may help decrease churn within their own social networks, resulting in even more savings.

Data elements are unique to every industry. In telecommunications, for example, providers can leverage existing internal usage data from the customer's call detail records, such as who they call and how often. By analyzing this data you can offer central connectors special rewards or other customized experiences.

Other SNA applications: fraud protection and security

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

- 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 detects patterns, establishes linkages between individuals, and connects 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
- Terrorist groups are typically decentralized structures comprised of loosely connected individuals who operate under the radar. SNA has become an integral tool to uncovering terrorist threats, with investigations often proceeding along these lines:
- Suspects are identified
- Daily activities are 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 (ideology, size, age, networking activity and leadership) can be used to determine the likelihood and impact of terrorist activity.

Creating a foundation for SNA often involves new Master Data Management (MDM) strategies and technologies

Preparing for SNA: data and organizational considerations

Social network analysis is still in its infancy, but its adoption is growing quickly. Even if your organization isn't ready to implement SNA today, it's vital that you begin the process of "future-proofing" data gathering and storage strategies. Doing otherwise might create a serious competitive disadvantage in just a few months.

One of the greatest challenges in SNA is coping with the massive amount of data that's aggregated and analyzed. Every day people create 2.5 quintillion bytes of data; your own customer database grows daily through the transactional information that offers insight into existing customers. If you can't make sense of the amount of data you have today, how will you manage it tomorrow?

Yet, managing the volume of data isn't the only challenge. Data may be inaccurate or incomplete (the leading cause of CRM headaches); it may be siloed by line of business, department or agency; and it may be inaccessible. Today's Master Data Management (MDM) approaches must 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

Clearly defining and establishing a foundation of quality data will help you optimize segmentation, marketing and the customer experience as a whole.

You'll also need a supporting organizational structure. This means breaking down operational silos and communicating the importance of integrating data about both individual business transactions and network interactions. Such an effort might ask employees to wear different hats and communicate across business functions. It will require senior management support and appropriate investments in enabling technology.

Social media is driving growth in customer information. Social network analysis can help you vastly improve predictive analytics to understand and influence consumer behavior. SNA is a competitive necessity that can be applied across many areas of your business in addition to marketing. Proper data management is the essential foundation of a successful SNA program.

Pitney Bowes 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 is already helping corporations and government agencies lay the groundwork for advanced network analysis.

3"Social Network Analysis: Decrease Churn Rate at Telecom Operators," NimzoSTAT White Paper, Rudy Jacob and Philippe Kerremans (March 2010). 3)

Customer Information Management

Today's customers empowered with access to rich sources of real-time information expect a new level of accuracy, precision and data management performance. The Spectrum Technology Platform from Pitney Bowes helps organizations provide trusted customer data and associated insights, in context, to applications like Business Intelligence, analytics, data warehousing and CRM.

This allows organizations to personalize the customer experience across channels, accelerate compliance initiatives, better manage risk associated with customers and make business operations more efficient.

Data quality

By using the Spectrum platform for data quality, organizations can ensure that data is fit for use in business processes ranging from core operations to analytics and decision-making to engagement and interaction with external technologies.

Using Spectrum, an online grocery delivery company reduced duplicate customer records by 25% for greater efficiency and customer satisfaction. By setting up data stewardship and governance workflows associated with claims handing, an insurance company not only improved the quality of incoming claims data but also optimized its entire claims process.

Data integration

By using the Spectrum platform for data integration, organizations can construct a data access and data delivery infrastructure to consolidate customer information from disparate data sources for master data management, analytics, business intelligence and more.

A leading telecom provider in Asia relies on our data integration technology to consolidate customer billing across its product lines. This improved the customer experience and retention through timely and more personalized communication.

MDM for customer data

By using the Spectrum platform for master data management, organizations can establish a trusted, shared and multi-dimensional view of customers to support a wide variety of business operations and decision-making.

A multinational bank used Spectrum to establish a single customer identity across all business units to deliver a consistent customer experience through every channel. With an integrated view of policyholders, a US-based insurer identified and retained highly profitable policyholders and increased cross-sell between high-net-worth personal and small commercial lines.

Customer analytics

By using a combination of the Spectrum platform and Portrait™ technology, organizations can analyze customer data to optimize decisions and use resulting insights to design programs for acquisition, retention, cross-sell/up-sell and targeted marketing campaigns.

An international marketing agency relies on our technology to optimize mass media buying for direct marketing, leading to above-average response rates at a significantly reduced cost per inquiry. A leading telco in South Asia uses Spectrum to improve the effectiveness and accuracy of its business decisions by analyzing a combination of customer demographics, network coverage and retail location data.

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