

# Innovating CI: Borrowing Analytic Techniques From Other Disciplines

Shelly L. Freyn and Melonie  
K. Richey



Every CI professional is familiar with the hallmark analytic methods of the discipline: Porter's Five Forces, SWOT Analysis, STEEP or PESTEL, the BCG Matrix. These methods are analytic tools that any graduate of an MBA program can pull out of their back pocket and use to tackle the vast array of CI topics that demand attention today.

The truth of the matter is that the challenges that CI professionals face today are not the same as even a decade ago. Product-driven marketing has fallen by the wayside, replaced by service-centered marketing and product co-creation with consumers (Vargo & Lusch 2004). Predictive consumer analytics has become increasingly important as there are countless sites that allow consumers to review both companies and products, open and available for all to see before making a purchasing decision (Amazon and Glassdoor, to name a few). This last point introduces big data initiatives into the conversation. The ways in which big data are redefining marketing strategies and the discipline of intelligence are innumerable (Newman 2014).

Rita McGrath (2013), in a recent *Harvard Business Review* article, referenced the need for innovation within the context of business strategy, terming it the "transient advantage." According to McGrath, "in a world where a competitive advantage often evaporates in less than a year, companies can't afford to spend months at a time crafting a single long-term strategy. To stay ahead, they need to constantly start new strategic initiatives, building and exploiting many *transient competitive advantages* at once" (McGrath 2013). A competitive strategy cannot afford to stagnate within the rapidly evolving business arena, and neither can a competitive intelligence strategy.

Given all of these disruptions to traditional business practice, the assertion that the new business environment requires new analytic methods seems obvious. But from where should CI analysts get these 'new' analytic methods? Creating anything from scratch is a tedious process and company or industry-specific methods are not generalizable across multiple domains. So the question remains where

do CI analysts turn for the 21st Century Five Forces Model?

The most effective methods are generally the most tested methods, suggesting that the optimal solution to the methods polemic is to borrow analytic techniques from disciplines addressing similar predictive problems. The CI operating environment is characteristically fraught with uncertainty and plagued by the necessity of real-time analysis, yet these obstacles are not unique to CI pursuits. Remember when Jan Herring spearheaded the idea of Key Intelligence Topics (KIT) based on the National Intelligence Topics (NIT) model within the national security community (Herring 1999)? Or what about the incorporation of military war-gaming into competitive intelligence? These are excellent examples of analytic approaches crossing the borders of disciplines and of analysts repurposing tried and true models towards solutions for modern problems.

Luckily, competitive intelligence

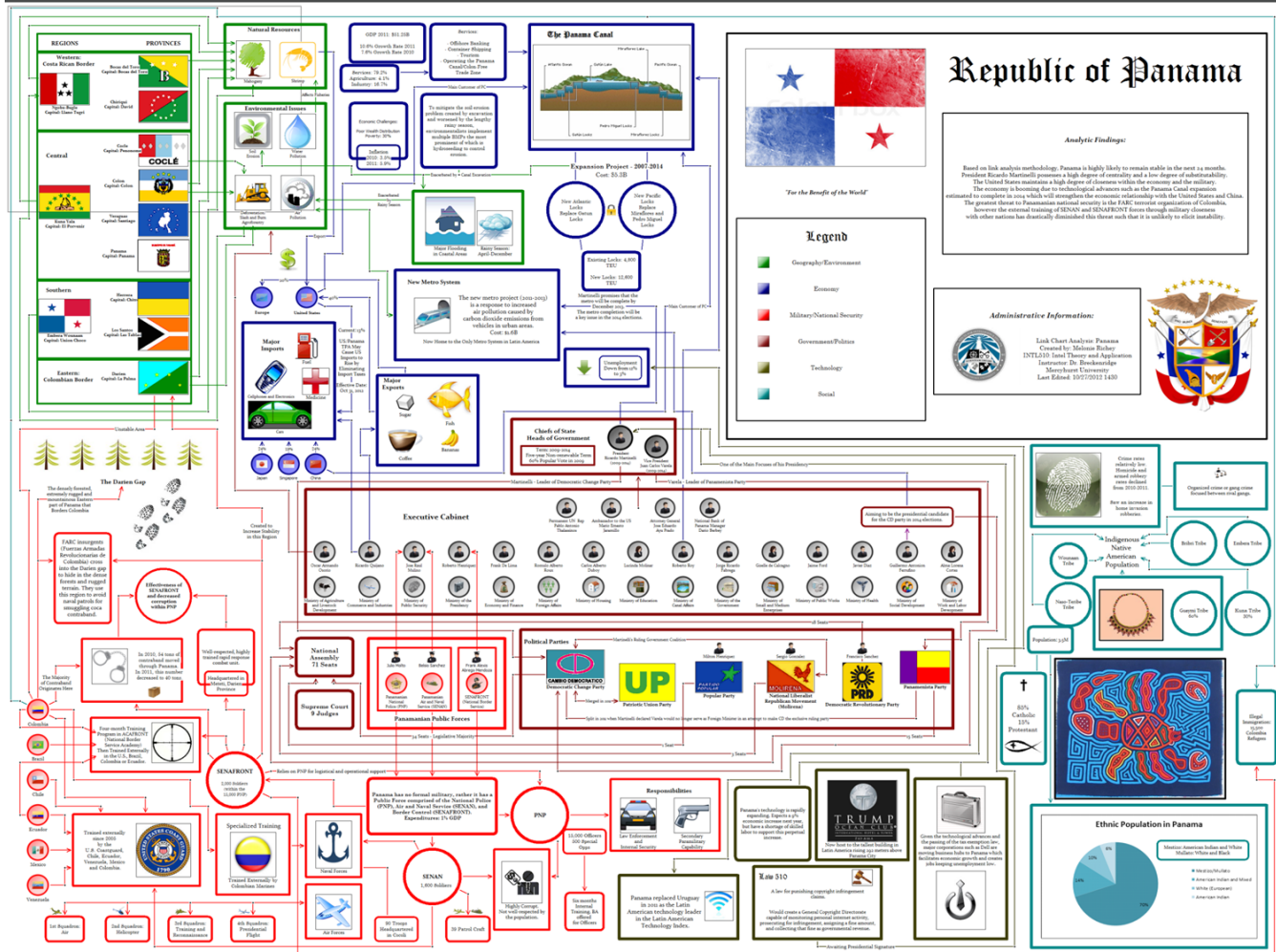


Figure 1. Country Stability Study Link Analysis of Panama

shares the same goal of gathering information and determining *actionable* next steps to reduce uncertainty and surprise for a decisionmaker with two other rapidly evolving disciplines: National security and law enforcement. Within these domains there exist a plethora of analytic techniques widely applicable within the context of CI. The following examples demonstrate the overlap between CI-specific goals and techniques used on analogous problem sets in other disciplines, in addition to ways in which CI professionals can benefit from integrating these techniques into their analytic tool boxes.

**LINK ANALYSIS**

Link Analysis is one of many methods with the capacity to provide CI professionals and their decisionmakers with a visual representation of multiple components within a competitor profile, from the leadership structure to the M&A strategy, and how these components dynamically interact. Within the realm of national security, analysts routinely use link analyses for country stability studies with the purpose of identifying strategic links between 'macro segments,' or domains of analysis (See Figure 1). Such links represent people or relationships that a

decisionmaker can then explore, exploit, or seek to disrupt.

Link Analysis is one of many methods with the capacity to provide CI professionals and their decisionmakers with a visual representation of multiple components within a competitor profile, from the leadership structure to the M&A strategy, and how these components dynamically interact. Within the realm of national security, analysts routinely use link analyses for country stability studies with the purpose of identifying strategic links between 'macro segments,' or domains of analysis (See Figure 2). Such links represent people or relationships that a decisionmaker can then explore, exploit or seek to disrupt.

The macro segments represented within any link analysis are dependent on the analytic objective. For example, for the purpose of a country study, macro segments might be the target country's economy (GDP, imports, exports, trade partners), infrastructure (rail systems, road systems, power grid, waterways), political environment (political structure, ambassadors to other countries, involvement in international organizations like

NATO), and/or social situation (demographics, social stratification, ethnic groups, language). Within the domain of law enforcement, analysts use link analyses to assess organized crime rings such as drug trafficking organizations, investigating macro segments such as production and processing, transportation, distribution, and finance.

Looking at this method from the vantage point of the CI professional, it is easy to see how applicable macro segments could be the categories associated with STEEP or PESTEL (Political, Economic, Social, Technological, Ecological and Legal) analysis. Such an analysis could easily depict changes in environmental regulations with legal ramifications for a company, evolving social trends with marketing implications or technological advancements that might fundamentally alter a company's strategy. From the example in Figure 1, if a company were looking to expand into Panama, strategic links between the political cabinet and the infrastructure macro segment reveal not only what new infrastructural initiatives Panama is pursuing, but who is in charge of them. Other links to infrastructure highlight the material suppliers for big projects such as the expansion of the Panama Canal. This displays what other countries and companies are players within each project space which a CI analyst can then use to identify both competitors and possible collaborators.

Beyond macro analysis (PESTEL), analysts can develop more focused link analyses at a competitor or industry level to visualize any shifts or changes that may aid in predicting future strategies. In 2012, analysts did exactly this to outline Accenture's mergers, acquisitions, and partnerships for a client. Figure 2 identifies Accenture's M&A strategy within their two largest portfolio sectors: Automation and Data Analytics. In the case of Accenture, the analysts identified that a strategic link existed between the focus of the company's Data Analytics pursuits (consumer analytics and life sciences) and the 2012 acquisition of Octagon Research Solutions, a pharmaceutical company. This link exists because, shortly after this acquisition, Accenture began to implement technology associated with consumer and predictive analytics within Octagon. Knowing that shortly after this acquisition Accenture initiated a data analytics partnership with MIT allows analysts to predict that MIT's data analytics pursuits will likely shape Accenture's consumer analytics focus in the future.

The implications of this link for Accenture's competitors is that by researching MIT's consumer analytics initiatives, analysts can gain insight into future moves Accenture might make regarding data analytics within the pharmaceutical industry (which will likely first appear at Octagon). While

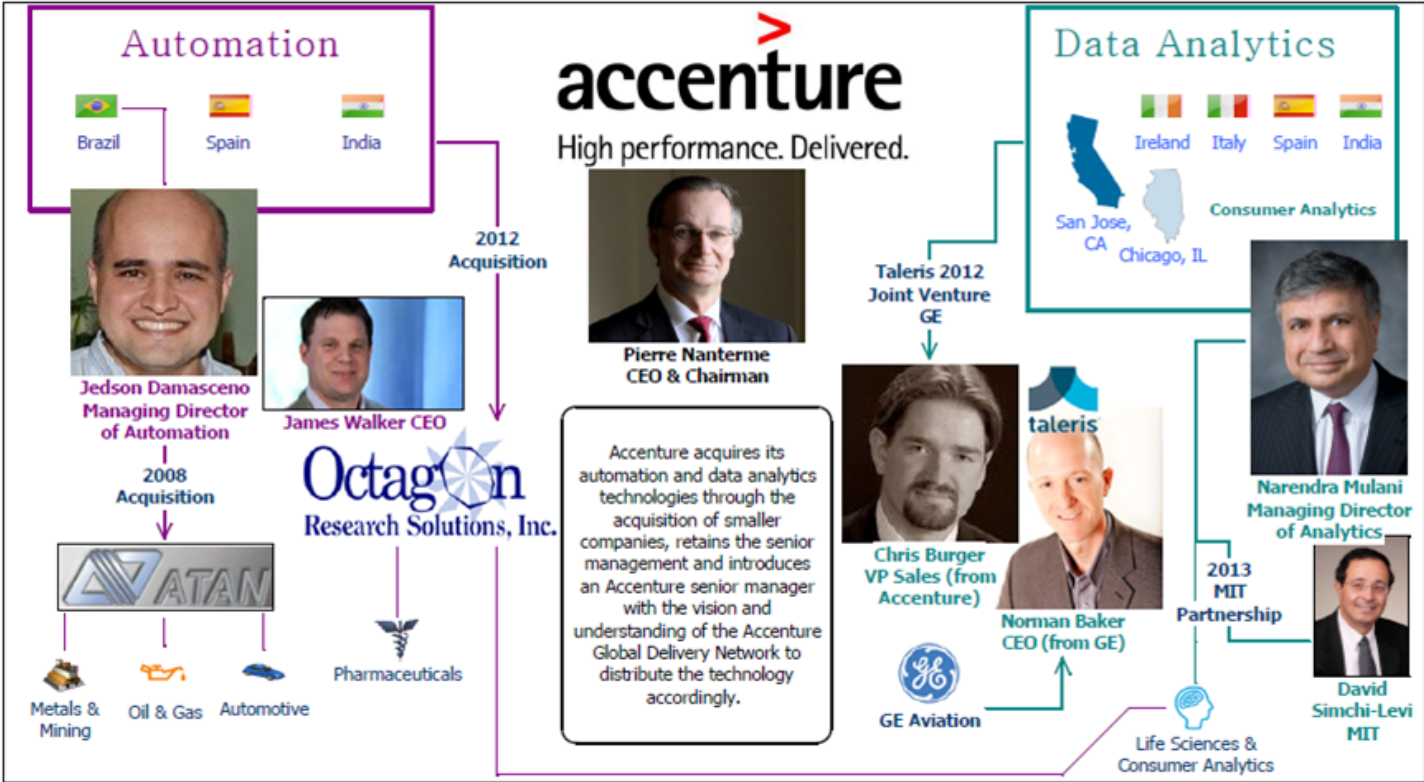


Figure 2. Accenture M&A Link Chart within Automation and Data Analytics Portfolio Sectors



## (SOCIAL) NETWORK ANALYSIS

Dipping into the realm of big data, an analytic tool that is arguably applicable within any industry is network analysis (of which both social network analysis and link analysis are sub-categories). The reason that the *social* portion of *social network analysis* is optional is because network analysis is not all about Twitter, Facebook, and crowdsourcing. Some variation of a network underlies every complex system, of which a competitor's strategy is one.

Albert-Laszlo Barabasi, the authority in the field of network science, writes extensively about a network economy in his book *Linked* (a must-read for every analyst), stating that "the truly important role networks play is in helping existing organizations adapt to rapidly changing market conditions. The very concept of a network implies a multidimensional approach." (Barabasi 2002) And that, of course, is what any analytic professional should advocate: An approach as multidimensional as it is interdisciplinary.

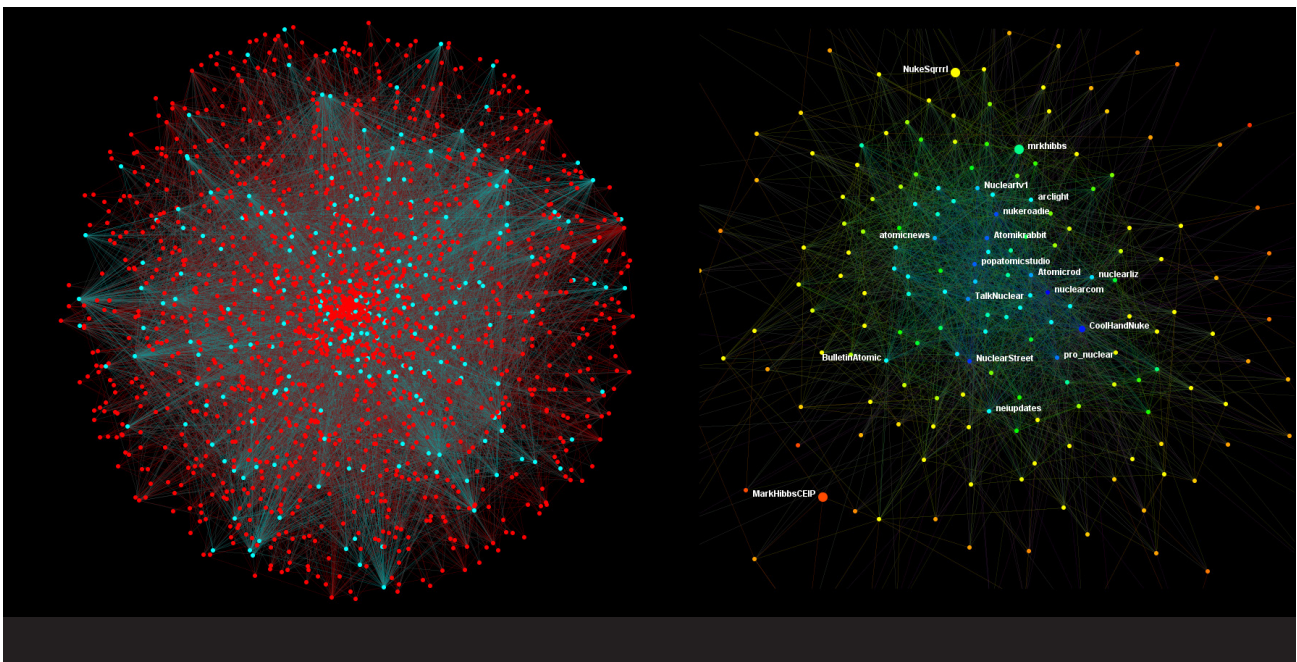
In short, networks are the key to understanding how large entities and complex systems work - how information flows, how money moves, how technology is adopted, how ideas spread, how people interact, etc. For the purposes of modeling these interactions, analysts can turn to network analysis.

Arguably, the most utilitarian function an analyst can perform with any network analysis tool is to take an exceedingly large network and identify the most important nodes or actors within it (Wheaton &

Richey 2014). In other words, who or what makes the network function? The answer to this question lies within a comprehensive understanding of the power wielded by certain nodes and links within a network. An analyst can reach this degree of understanding by assessing the network against various centrality measures, which serve as means for measuring a node's relative importance within a network (Newman 2009).

Nodes are important within networks for many different reasons, hence the multitude of centrality measures that exist. Any analyst can quickly identify key actors within a network, however, with a very basic understanding of a few key centrality measures. For example, a node with a high *total degree* centrality is a node that has many connections (regardless of what types of connections these might be). A node with a high degree of *eigenvector* centrality is a node that has many connections to other well-connected individuals. A node with a high degree of *betweenness* centrality is a node that sits strategically between clusters of nodes (or cliques) that would otherwise not be connected.

It is having these centrality measures in the analytic arsenal that allowed analysts to reduce a network comprised of nuclear enthusiasts on Twitter from 200,000 nodes and over 700,000 links to the 18 most influential individuals within that network (See Figure 4).



**Figure 4.** Network of 200,000 nodes (left) reduced to 18 top influencers (right). *Source:* Work for the American Nuclear Society by Melonie K. Richey and Kristan J. Wheaton

Now imagine that the network pictured above is a network of major players within varying industries (remember the macro segments discussed in the link analysis section?). The node in the network with the highest degree of betweenness centrality is the node that connects the transportation industry with the packaging/storage industry. In other words, that node is the company that can provide your company with both services. Perhaps the nodes are sized based on how much the company would charge for the service.

So now that we have established that every node in the network is a company, the 18 most influential nodes will become the 18 most influential companies. It is to these companies to whom you would pitch your new product line. Why? Because by targeting these 18 companies within the 200,000 company-strong industry space, your product will likely achieve the highest degree of market penetration in the least amount of time. Don't believe it? Run a simple simulation through the network to verify the assertion.

The best part is that this particular piece of analysis takes only a few hours to produce. Again, where did analysts get this data? A simple Excel add-on called NodeXL produced by the Social Media Research Foundation that mines Twitter, YouTube, Flickr or Facebook for keywords or specific users and arranges the output in an Excel spreadsheet. This is only one of the many functionalities of network analysis, notwithstanding simulation features which predict how information, money, technology or disease will likely flow through and penetrate a network.

One final aspect of network analysis that makes it a particularly flexible method in terms of application is the notion that it is applicable at various levels. The network itself is meant to represent an operational space. This can refer to a single organization, an industry, or a macro segment. This means that nodes can be people within a company, companies within an industry, or industries within the larger environment (think employees within GE, GE and all of its competitors in the manufacturing industry, or the manufacturing industry alongside the retail industry, food service industry, metals and mining industry, etc.). The trick to mastering the abstract nature of this particular method is understanding how to bend its variety of capabilities such that it fits your specific analytic pursuit.

### COMMUNICATING ANALYSIS

All fancy images aside, advanced analytic strategy means nothing if an analyst cannot effectively communicate it to a decisionmaker. Incorporating

the concept of triangulation, a simple tool has been designed to do just that, communicate. The most advanced program it requires is Microsoft Excel or Word, but it is an extremely effective way of presenting analysis to a decisionmaker that wants concision and comprehensiveness in the same executive summary-style presentation.

*Methodological triangulation* is the use of one or more methods to analyze the same problem (Mitchell 1986). It is no stranger to advanced research, intelligence analysis or the social sciences (Hussein 2009). When you've got all the analysis compiled, the briefing book of 50 plus pages, the charts, the financial numbers crunched, the idea is to simply and effectively present and support your key findings. Analysts first, rank order their key findings in terms of priority for the decision-maker. From there, by triangulating three or more sources (methods), analysts present how they arrived at their conclusions. Finally, strategic implications of these findings are incorporated; thereby supplying a valuable tool that takes large complex volumes of analysis and creates a story of findings, support, and strategy for the decisionmaker, all in one document (See Figure 5).

Incorporating the triangulation method forces analysts to corroborate their sources and reduces inaccuracies that result from single-source research. Additionally, this tool may entice decision-makers to venture further into the analytic report in order to read more in-depth analysis regarding key findings of particular interest. In a world where five minutes of an executive's time is a hot commodity and senior-level execs routinely suffer from the data dump form of information reporting, the triangulation spreadsheet is a breath of fresh air for the decision-maker and a boost of confidence for the analyst. It also ensures that the implication of each finding is explicit.

While the idea of triangulation is old, this form of presentation is new. Even more utilitarian than the executive summary, this tool provides an effective and direct way to present the results of complicated analysis while corroborating sources; executive summaries and dashboards cannot as easily complete this task. Accompanied with a few compelling visuals, it has the potential to reduce a 50-page data dump to a more focused and informative piece of analysis that a decision-maker is more likely to read. Beyond the utility to a decision-maker, however, this tool can also demonstrate the value of CI to an organization through better communication of analysis and clear implications to the decision-maker.

Figure 5. Triangulation for Presentation of Key Findings  
Source: Shelly Freyn and Leslie Guelcher

Key Finding	Sources	Implications for [REDACTED]
<b>PRIORITY: A HIGHEST IMPACT</b>		
1. Accenture’s main focus is its Global Delivery Network which creates capability-specialized hubs in global emerging market locations.	Competitor Profile: Operations, Strategy STEEP	Accenture presents the ideal partnership opportunity for a technology-rich company in need of a foundational network within which to disseminate its product.
2. Accenture does not focus on proprietary technology, rather emphasizes the consulting aspect of its business, which accounts for 53% of total revenues.	SWOT Analysis, Competitor Profile: Financial, Capabilities, Products and Services	Within a partnership, Accenture handles the consulting, support, installation and the majority of the customer interaction. This could greatly assist [REDACTED] in strengthening brand presence within the U.S.
3. The High Performance. Delivered marketing strategy revolves around a case study approach that features both Accenture and the customer or partner heavily.	Competitor Profile: Marketing Five Forces Model	Accenture has a strong marketing presence in the United States with currently a highly effective campaign. Appearing in one of Accenture’s collaborative commercials could be a good way for [REDACTED] to promote brand notoriety within the United States.

FINAL NOTES

The purpose of this article is not to say that traditional CI methods are outdated, nor is it to advocate that newer analytic methods are foolproof. Rather, an increasingly complex operational space requires new ways to understand what is happening around us. The possibilities of this necessity are endless. For example, think about creating a network representative of each of Porter’s five forces. Suppliers, customers, potential substitute products will all become nodes in the network. With this type of architecture, analysts can then simulate changes in the environment and demonstrate to decision-makers how certain entities would likely react and how certain events might change the strategic landscape. Perhaps more important still than *borrowing* analytic techniques from other disciplines is *blending* analytic techniques from multiple disciplines.

It should be the goal of every analyst to avoid data-driven models or estimates dictated by what data is available. Similarly, it should be the goal of every analyst to avoid method-driven models or an estimate guided by method as opposed to requirement or inquiry. In an increasingly networked, transient, and unpredictable world where markets are constantly shifting and “industry lines are blurred,” companies require innovative strategy just as much as they require innovative intelligence (McGrath 2013).

But CI analysts do not have to create this innovation

from scratch. Rather, sources, methods, and process (as well as both collection and presentation) can all benefit from analytic techniques originating in fields with similar goals and obstacles as CI. Innovation occurs at the intersection of disciplines. It is with this logic that CI professionals should seek to expand analytic practice to mirror the increasingly sophisticated strategic environment in which companies operate today.

REFERENCES

Barabasi, A. L. (2002). Linked: How everything is connected to everything else and what it means. lume Editors.

Bergstrand, J. H. (1985). The gravity equation in international trade: some microeconomic foundations and empirical evidence. The review of economics and statistics, 474-481.

Herring, J. P. (1999). Key intelligence topics: a process to identify and define intelligence needs. Competitive Intelligence Review, 10(2), 4-14.

Hussein, A. (2009). The use of triangulation in social sciences research: Can qualitative and quantitative methods be combined. Journal of Comparative Social Work, 1, 1-12.

McGrath, R. G. (2013, June 1). Transient Advantage. Harvard Business Review.

Mitchell, E. S. (1986). Multiple triangulation: A methodology for nursing science. *Advances in Nursing Science*, 8(3), 18-26.

Newman, D. (2014, April 16). Why Small Companies Need Big Data. The Huffington Post.

Newman, M. (2010). *Networks: an introduction*. Oxford University Press.

Vargo, S., & Lusch, R. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing*, 68, 1-17.

Wheaton, K. J., & Richey, M. K. (2014, January 9). The Potential of Social Network Analysis in Intelligence. *E-International Relations*.

---

*Shelly Freyn, MBA is an assistant professor in the Department of Intelligence Studies at Mercyhurst University. She teaches undergraduate and graduate competitive intelligence courses. Shelly brings over 20 years of corporate experience working in R&D, marketing research and technical sales. Shelly is a DBA student with research interests in strategic intelligence. Shelly now mentors students on CI projects with many top companies.*

*Melonie K. Richey. Ms. Richey is an analyst within Mercyhurst University's Center for Intelligence Analysis, Research and Training (CIRAT). Her current research focuses on the fusion of geospatial modeling with network analysis techniques, interdisciplinary pedagogy for intelligence training and OSINT collection methods. With a background in Linguistics from the University of Florida, Ms. Richey's research interests entail the importance of interdisciplinary approaches to intelligence analysis and mixed methods.*