The Role of Culture in Business Intelligence

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ABSTRACT

Global business intelligence will struggle to live up to its potential if it fails to take into account, and accurately interpret, cultural differences. This paper supports this assertion by considering the concept of culture, explaining its importance in the business intelligence process, especially in foreign markets, and demonstrating that attention to culture is currently inadequate in most international business intelligence efforts. Without a tool capable of modeling social interaction in disparate cultures, BI efforts will under perform when extended to the global arena. The Cultural Simulation Modeler is examined as a means of enhancing essential cultural awareness. The core components of the modeler are explained, as are the limitations of automated information gathering and analysis systems.

Keywords: *Context, Cultural Simulation Modeler, Culture, Global Business Intelligence, Global Competitive Intelligence, Situation, Threat Assessment*

INTRODUCTION

Enhanced technology, travel, communications, and economic globalization contribute to making the world seem as if it is becoming smaller. As a result, events manifest at a faster pace and are affected by a wider variety of circumstances and conditions.

One aspect of internationalization is that organizations now deal with a variety of national and regional cultures. Organizations often think they understand the cultures with which they interact, but they frequently fail to grasp the subtle nuances and resulting consequences of foreign cultures. Culture has a very deep and implicit influence on behavior whether managers are aware of it or not (Bensoussan & Densham, 2004). Cultural differences affect planning, problem detection, situation awareness, uncertainty management, and decision making. Cultural differences in cognition and in world view can seriously impede expansion into foreign markets (Klein, Pongonis, & Klein, 2002) and companies often fail in their ventures into these markets due to serious errors and misjudgments concerning the social, cultural, and political environment (Tian & Tobar, 2004).

DOI: 10.4018/jbir.2010070101

Another aspect of our changing world is that organizations must be constantly aware not only of cultural issues, but of all factors in their operating environment that might present threats or opportunities. Organizations that fail to monitor their environment to determine the conditions under which they must operate court disaster (Mitroff, 1985). Identification of key economic, social, and technological issues that affect the organization, its life cycle stages, and their relevance to each other helps managers allocate attention and resources to them. One tool through which this is accomplished is business intelligence gathering and analysis. Business intelligence gathering and analysis is a fundamental step in the chain of perceptions and actions that permit an organization to adapt to its environment. Organizational adaptation, survival, and competence in the face of increasingly discontinuous environmental change require access to timely and accurate information, as well as tools to constantly monitor, analyze, and interpret that information (Malhotra, 1998).

Cultural bias is a real phenomenon and must be considered in intelligence gathering and analysis. Note that this applies not only to business intelligence but also to intelligence gathered on behalf of governments. Hence, the Cultural Simulation Modeler (CSM) was developed by IndaSea, Inc. under the auspices of the United States Defense Threat Reduction Agency as a terrorism threat assessment tool. The CSM is a software system that monitors multicultural interaction in order to anticipate threats and opportunities as they emerge from complex situations (IndaSea, 2004). The premise for the system is that increased understanding can be obtained by viewing a situation from multiple, culturally specific, empathetic points of view (Fables & Park, 2005). When academics were consulted to independently assess the tool they immediately recognized that the tool had the potential to be applied equally well to business intelligence gathering. Hence, the goal of this paper is to first make the case for the inclusion of cultural considerations in the gathering and analysis of business intelligence, then to present a discussion of the design of the CSM and how it operates, and finally to consider the limitations of automated information gathering and analysis systems.

BUSINESS INTELLIGENCE

The terms business intelligence (BI), competitive intelligence (CI), market intelligence, and even environmental scanning are often used interchangeably (Bouthillier & Jin, 2006). However, while some may consider it overly punctilious, many make a distinction between BI and CI (Fleisher, 2003). In keeping with that differentiation, we will use the term business intelligence. According to Frates and Sharp (2005) BI reflects a broader strategic orientation and use for information than does the more narrow definition of CI. Competitive intelligence is often limited to competitor intelligence, focusing on identifying, monitoring, and understanding specific current competitors, whereas BI targets *any* information in the business universe that affects a firm's ability to compete. This broader perspective targets developments beyond the current competitors and the immediate industry to anticipate significant marketplace changes that affect both a given industry and a particular competitive market arena. Therefore BI is becoming an accepted means of gathering and analyzing information for use in developing global strategies.

Organizations use the BI process to gather information, to add value to it through analysis, and to report the findings to managers to solve a wide variety of problems or satisfy requests for information. BI projects range from competitive information about competitors or customers to information on mergers and acquisitions or recruiting. The types of information needed to answer these requests may include financial information, demographics, biographies, economic indicators, news articles, and customer and competitor information. Some types of information are easily gathered, while others require greater amounts of time and money to obtain. According to the Society of Competitive Intelligence Professionals (SCIP), using

publicly available information will satisfy most analysts' needs. The open sources of this data include research findings, reference sources, marketing information, discussion information, legal information, and U.S. Freedom of Information Act information. This information may be free via sources like the library or the Internet, or it may require the payment of a fee to access information from a wide variety of data sources such as Hoover's Company Data Bank, Standards & Poor's, or NewsEdge (Breeding, 2000). Once the information is secured, it must be analyzed and proper reports must be generated and disseminated to the appropriate individuals within the organization.

THE IMPORTANCE OF CULTURE IN BI

Hofstede (2001) defines culture as "the collective programming of the mind that distinguishes one group or category of people from another." This mental programming begins at home at a very early age and is then reinforced by the educational system as well as throughout adulthood via various organizations and social institutions. Therefore culture is shared among, influences, and is shaped by members of a group, community, institution, and the environment (Chandler, 2005). The implication of this research for global BI efforts is that these mental programs drive the different values held by people from different cultures.

Cross-cultural work in technological disciplines "remains in its infancy" because of a lack of agreement about the meaning and definition of the underlying construct culture (Straub, Loch, Evaristo, Karahanna, & Strite, 2002). The very term, when used in conjunction with organizations, can refer to the organization's culture or the culture of the environment within which the organization operates. Hofstede's (1980, 2001) pioneering work examines the culture of an organization operating across various national and regional cultures. His book is one of the top 100 cited sources in the Social Science Citation Index, and his conclusions on global cultural heterogeneity have been validated via rigorous statistical analysis and verified by many cross-cultural studies conducted by others (Knip, 2006). Hofstede's (1980, 2001) central thesis focuses on the uniqueness of each national culture. His research of global cultural heterogeneity across the countries of the world "identifies five main dimensions along which dominant value systems in more than 50 countries can be ordered, and that affect human thinking, feeling, and acting as well as organizations and institutions, in predictable ways" (Hofstede, 2001).

Hofstede's (1980) dimensions represent the basic elements of common structure in the cultural systems of the countries, providing a framework not only for analyzing national culture, but also for considering the effects of cultural differences on management and organization (Pheng & Yuquan, 2002). This framework is especially useful for understanding people's conceptions of an organization, the mechanisms that are considered appropriate in controlling and coordinating the activities within it, and the roles and relations of its members (Hoecklin, 1995). In other words, Hofstede's dimensions enable a company to determine how to best structure its organizations located in various cultures throughout the world, allowing the organization to adapt its organizational structure and incentive systems so that it is consistent with the country of origin's cultural dimensions (Van Ness, Seifert, Franko, & Buff, 2005).

Although highly acclaimed, Hofstede's work is also widely criticized. Many critics assert that Hofstede presents an overly simplistic dimensional conceptualization of culture, uses an original sample derived from a single multinational corporation (IBM), ignores the existence of substantial within-country cultural heterogeneity, uses invalid measures, and overlooks the fact that culture changes over time rather than being static as suggested by the dimensions (Dickson, Den Hartog, & Mitchelson, 2003). Further, he fails to account for factors such as religious orientation (Van Ness et al., 2005). Since business intelligence is focused on the cultural aspects of an orga-

nization's external environment rather than its internal environment, Hofstede's dimensions have limited relevance to this study.

Culture and BI

The majority of international BI practitioners currently neglect the need for a clear understanding of the differences in cross-national boundary perspectives as well as in cross-cultural perspectives (Tian & Tobar, 2004), and as a result of this inattention to the pervasive impact of culture many global BI programs fail to realize their full potential (Knip, 2006). If managers assume that others interpret and react as they do, manage uncertainty as they do, and think about real and hypothetical issues as they do, there can be unanticipated problems (Klein et al., 2002). Such ethnocentrism lies at the root of inattention to cultural diversity and often afflicts the transition from a domestic BI program to a global BI program (Knip, 2006).

Prescott and Gibbons (1993) identify five issues that can impede international BI efforts:

- The types, timeliness, accuracy, and motives for data collection can vary by culture.
- The ethical standards for acquiring information vary from country to country, as do the attitudes toward the individuals performing the collection.
- The technologies used in the production, storage, movement, analysis, and timing of information may vary dramatically across countries.
- Language barriers can impede both the collection and analysis of information.
- Culture-specific idiosyncrasies must be taken into consideration.

Gathering and Analysis

As corporations increasingly operate across national borders to enter foreign markets, BI professionals must gather data about and analyze the competitive environment in different cultures (Elizondo & Glitman, 2002). Ignorance of cultural factors can negatively impact both aspects of business intelligence.

Global BI gathering is much more complicated than on a domestic level (Feiler, 1999). Even geographically close countries can be characterized by huge differences in information sources, language, and culture (Elizondo & Glitman, 2002). Cultural awareness enables the global BI function to recognize and pick up the ambient signals while they are still leading indicators (Knip, 2006).

Regardless of the availability of information or how information is gathered, analysis is required before actual intelligence is revealed. It is important to understand that the analysis of information does not occur in a vacuum, but must take place in the proper context. Without context the resulting intelligence is meaningless. If analysts do not understand cultural information in terms of country-of-origin, ethnic basis, or religious basis, they may very easily misinterpret the data and how and why the players make their decisions. Such misinterpretations can impair the effectiveness of strategic decisions. Without cultural awareness, analysts can easily draw incorrect strategic inferences (Knip, 2006), because BI investigators unaware of cultural factors may inadvertently impose their cultural bias or make culturally based assumptions (Tian & Tobar, 2004). Leveraging cultural influencers creates insight to intended consumers' most basic thoughts and planning processes. Awareness of behavior systems allows analysts to be more in tune with the target market and better able to prepare for the next opportunity. This broader cultural perspective will likely expose threats and opportunities in global markets that may have otherwise gone unrecognized or misunderstood (Knip, 2006). Thus, sensitivity to cultural variables allows BI professionals to develop a more robust understanding of the competitive environment and can deepen the analytical content and the effectiveness of the intelligence delivered.

In summary, research indicates that in today's highly competitive global business environment BI requires cross-cultural sensitivities to compete effectively (Tian & Tobar,

2004). When BI takes into account the cultural perspective, a global BI manager is better able to overcome cultural influences.

A CULTURAL SIMULATION MODELER

The goal of the Cultural Simulation Modeler (CSM) is to gather and interpret information from different perspectives, points of view, and/or cultures. From that interpretation the modeler displays the vast amounts of complex data and interactions in a usable manner (Patil, Perry, & Hamon, 2005). The core of the CSM is the "cultural construct," the filter through which data sources are processed and a perspective from which they are understood (Resnyansky, 2007). The cultural construct is built using content from primary source documents and subject matter experts to provide contextual information to an issue or situation (Patil et al., 2005). Rather than using a static filter based on a snap-shot in time, the cultural construct is dynamic, receiving regular updates as new information becomes available. This makes the CSM better able to spot changes more quickly, allowing a quicker reaction on the part of decision makers. Further, instead of trying to eliminate bias in the interpretation of information (e.g., a news article), the CSM attempts to capitalize on the inclusion of numerous points of view, or perspectives, in the cultural construct to produce a multi-dimensional view of a situation or circumstance. This approach allows the CSM to identify threats, opportunities, and when different group's perspectives change or align with one another. Additionally it enables the identification of gaps in information required to adequately assess a situation (Patil et al., 2005).

Unanticipated or asymmetrical threats are normally detectable too late to put counter measures into place. However, awareness of cultural issues makes it possible for analysts to take into account how people of different cultures feel, think, and act so that they can more quickly identify threats or opportunities. As noted earlier, a dynamic information aggregator is better able to recognize environmental changes more quickly. This gives decision makers the opportunity to react more quickly as well, leading to agile decision making that can allow an organization to react before their competition. Continuous updates make it possible for live situational behaviors and time patterns to be quickly modeled and factored into the analysis.

Design

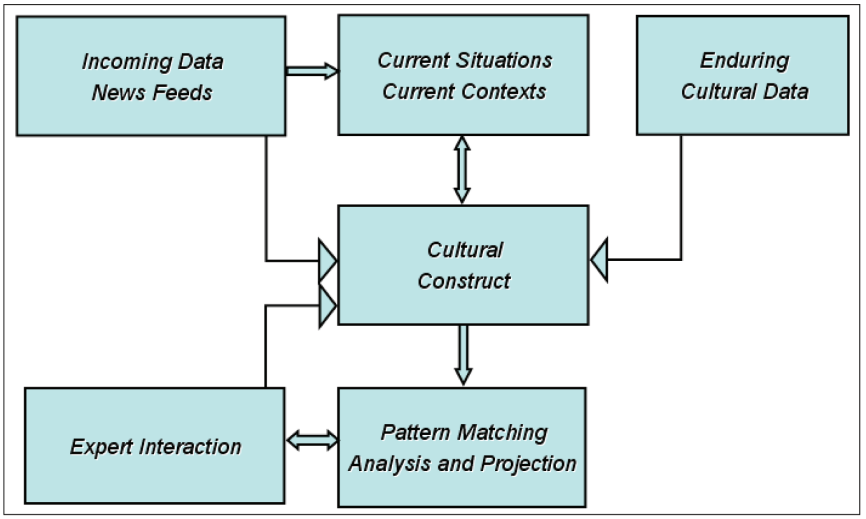
The design goal was to develop a system capable of uncovering meaning in such a way that it encourages the widest possible view to encompass both a range of cultural perspectives and an understanding of the direction of short, medium, and long trends in the relationships between cultures.

Certain assumptions influenced the design of the CSM. First, a very inclusive approach to information gathering is needed to build a body of data that reflects the wide and diverse range of ideas and opinions present in a culture. An inclusive body of data is needed to aid in understanding a complex, interwoven, conflicted, and biased society. Second, different individuals, groups, and cultures will perceive events in characteristic and sometimes unique ways. How these entities perceive events can be understood with the help of a system that provides a view of the entity's behavior in context over time. Third, the system requires a specialized data schema that is specifically designed to support cultural perceptions.

To gain cultural perspective on world events, at least three elements are required: (1) an understanding of history and enduring cultural data; (2) knowledge of the immediate cultural context influencing unfolding events; and (3) the ability to appraise the current state of a situation of interest. The system must handle the juxtaposition of these three elements and enable visualization of complex sets of information in ways that promote human understanding.

Figure 1 shows the overall application design. The CSM attempts to integrate disparate

Figure 1. CSM application design



units of data into a synthesized whole, with a goal of obtaining the widest possible perspective on ongoing situations, including opposing ideas. There are three categories of inputs that are filtered through the cultural construct. First, the CSM can be wired into Factiva (Dow Jones and Reuters) and/or other global data feeds, as well as a wide variety of Internet resources, in order to process a wide range of news and other data items about a particular region of interest (category 1) as well as about current situations and their contexts in that region (category 2). In addition, historic data about the culture is also provided to the cultural construct (category 3). As the process captures and preserves knowledge, it is imperative to keep that information in a cultural context. The cultural construct is discussed in detail in the next section, but it is a knowledge acquisition and contextual memory method used to "filter" the system inputs via autonomous data handlers, pattern matching, and other information filtering approaches. Specific cultural constructs are incorporated to support structural, relational, and situational questions from a BI perspective. The output of the system consists of integrated reports with visualization of live situational behaviors and time patterns that can be analyzed by subject matter experts and cultural analysts, i.e., someone trained in some aspect of human behavior and able to structure that information.

Specialized tools are provided to help organize, search, analyze, and visualize the output. In the act of producing an assessment, an analyst may be required to engage all of the above tools at some point in the work flow. The system is designed to provide data subsets for consideration, structured to reflect developments in the real world with the diverse cultural perspectives of the stakeholders in the situation under study.

The Cultural Construct

The CSM provides methods for structuring the flow of information in order to promote inclusion of cultural context. The structure built into the CSM to handle the flow is called a cultural construct. It builds heavily on the concepts of Actor, Situation, and points of view from symbolic interactionism. The idea of a cultural construct itself was borrowed from the fields of visual arts and computer animation (Resnyansky, 2007). Two concepts from those fields, Actor perception and emotional state, explain why a subjective perspective is needed in order to better understand a situation, society,

etc. The concepts of objective and subjective views are shaped by perceptive psychology. Whereas a subjective view is formed from the point of view of a single individual (a perspective that is unique and can be made from a particular point/distance only), an objective view is a view shared by most observers. For example, a group of people looking at a structure from a long distance will share a similar view. However, if they approach the structure each individual will have a different view because it is physically impossible for multiple individuals to occupy the same space. The concept of perception helps to shape goals and behaviors, and is closely linked to the concepts of context and culture (Resnyansky, 2007).

The cultural construct is comprised of the catalog of ideas and behaviors exhibited by all Actors in the system. It includes past, present, and possible future behaviors, and strives to be culturally inclusive in the widest sense. A constructivist method is used for building the cultural construct, whereby elements are added accompanied by a reference to the point of view they express, as well as other contextual information, on an element-by-element basis. Building the construct is an open-ended process in that elements are continuously added as new information is found as the result of information gathering.

The cultural construct is developed on the basis of information provided by experts, informal conversations with people, and so on. It requires a cultural (anthropological, sociological, etc.) study of a region aimed at developing a current conceptual model of the processes taking place in that society. One difficulty is the selection of relevant cultural knowledge and its systematization within a particular theoretical framework. This task requires deep cultural insights (an understanding of the target culture at almost the same level at which this culture is understood by its members) as well as an analytical deconstruction of the authentic cultural meanings in order to 'train' the software and to 'understand' the target culture. (Resnyansky, 2007).

A typical unit for a construct element would be a phrase that expresses a single idea. The phrases usually imply that they are spoken from a particular point of view, and are in most cases attributed to a particular Actor, although they can be subjective, ambiguous, or neutral in tone. In the CSM, the use of the Actor point of view is the cornerstone of the cultural construct. Providing a range of points of view for the analyst making the assessment is a key step to establishing a basis for understanding a Situation.

Importance of the Socio-Cultural Context

The actions of an individual or group cannot be understood apart from the socio-cultural context within which the individual or group identifies him/her/itself, which in the CSM is maintained by the Actor point of view. The individual or group may identify with multiple socio-cultural contexts, and the Actor may have multiple points of view. Recall that an Actor is defined as a subset of the cultural construct representing a particular entity, and can be a person, group, concept, or culture, particularly as it relates to a social Situation. Some examples of Actors are the region's people, any regional political organizations or movements, regional governments, and perhaps the local military. Each Actor's cultural point of view is represented in the model. The cultural point of view includes how each Actor sees, defines, and responds to a situation; in essence it is how they perceive and interact with the world (Park & Fables, 2006).

The contribution of social science to the development of cultural constructs for specific regions/cultures can be twofold (Resnyansky, 2007). First, the social scientist can provide subject matter expertise in the area of culturally-specific meanings, world views, and values. This kind of expertise is needed in order to identify the key cultural concepts and symbols shaping a culture's members' interpretation of the reality and, to some extent, governing their activities and actions. Second, the social scientist can draw upon structural and systemic analyses

of a particular society in order to develop a framework showing how cultural concepts and symbols relate to socioeconomic and political contexts, and in order to understand the relative relevance of particular concepts and symbols in different contexts. This analysis needs to take into account sociological studies of cultures and societies and an analysis of religion and ideology as cultural systems. It also needs to be informed by semiotic, anthropological, and psychological studies of cultural concepts and symbols (Resnyansky, 2007).

Understanding the socio-cultural context with a constructivist lens requires an understanding of how one's socio-cultural context is created. According to sociological theory, the socio-cultural context has two characteristics: "objective facticity" and "subjective meaning" (Berger & Luckmann, 1966). The relationship between the two characteristics is at the crux of sociological theory, and is the theoretical underpinning for a process of analyzing the phenomenon, including knowledge, actions, individuals, or groups that arise from specific socio-cultural contexts in a meaningful way. Sociological theory posits a dialectical relationship between the individual and the socio-cultural context. First, the socio-cultural context is a product of human beings, second, the socio-cultural context is real in an objective sense, and third, human beings are, in large part, a product of their socio-cultural context. Understanding this dialectical relationship is the first step to understanding how "subjective meaning" becomes part of the objective reality of the socio-cultural context. Human beings act upon and are acted upon by their socio-cultural contexts. This concept, known as the Great Sociological Paradox, emphasizes the importance of understanding not only how an Actor behaves, but also how that behavior is influenced by the Situation, and how the Actors themselves also influence what form a Situation takes. This holistic approach to analysis can provide a greater depth of understanding of a given situation of interest.

Given the need for a holistic approach to analysis of a Situation, the inclusion of multiple socio-cultural contexts, i.e., for multiple individuals, groups, and countries, is at the core of the CSM cultural construct. Conflicting points of view are incorporated into the cultural construct since a complete body of ideas and opinions is required in order that a situation be seen in enough width and depth that a degree of understanding of the current state is achieved. The CSM also provides a fractionation of a situation into the associated points of view as a means to organize and evaluate the completeness of coverage of relevant issues and stakeholders.

The Actor point of view is the unit of socio-cultural context in the CSM and the cultural construct is the aggregate of overlapping points of view in the system at any given time. As noted earlier, the formation of the construct is a dynamic process engaged in by human operators, who add elements organized into Actor points of view in response to perceived situations arising in the real world, and who incorporate new Actors when they are needed. The cultural construct constantly evolves in response to the external environment. At all times, however, it functions to produce assessments of the current state as reflected in the data feeds and as a collaborative memory for the CSM modelers and analysts.

Scales for the Model

The structuring of a point of view is influenced by a human perception-based metaphor borrowed from the visual arts – depth of field – whereby elements in the construct are perceived to exist in a plastic space gradating from the self to the view of a distant horizon. This depth of field can be structured in ten scales, where Scale 1 is closest to the Actor; in fact it is inside the Actor, and contains the most concrete and fastest changing information. The other end of the spectrum, Scale 10, is furthest away and most abstract, and comprises very slowly changing ideas. Elements added to the construct are initialized by the cultural modeler with one of the ten scales. Elements in the construct that are assigned the same scale are considered to have certain parity in the depth of field no mat-

ter which Actor point of view they reference. The progression in scales, from far to near, can be expressed in the following terms: (10) universal, (9) religions, beliefs and values, (8) institutions, countries and geography, (7) trends and processes, (6) groups and resources (5) individuals and roles, (4) influences and memory (3) actions, (2) emotions, (1) current state of awareness.

Emphasizing one or a subset of scales when performing an assessment will cause the output to be presented in different ways. Understanding issues at the policy scale, a Scale 7 idea, requires a different emphasis than understanding the way people of different cultures get dressed, a Scale 6 idea. The former refers to the institutional-level activities of countries, while the latter refers to individual and group actions. If a gradation of ideas in the construct can be established that encompasses ideas at all levels, a deeper understanding of context will be achieved, and the more versatile the system will be at providing assessments of various types.

The process of building a cultural construct, therefore, includes the attempt to achieve coverage of culturally relevant ideas in a range of scales and across a range of points of view. Generally, however, all scales cannot be represented equally due to limitations imposed by the type of assessment the model is addressing and the resources available to the study.

OUTPUT OF THE CSM

The first tier of analytical tools tracks waveforms of concepts and phrases in order to identify hot spots and anomalous behavior. The second tier uses the construct to look at cultural specifics and particular points of view of the Actors involved. All Actors in the news plus additional Actors deemed worthy for inclusion by the operators are processed. It is understood that what is good for one Actor can be bad for another. This means that truth is relative and that the perception of events is of great importance when determining meaning from human behavior. The third tier looks at the particulars of a Situation in a particular cultural context in order to analyze specific actions and behavior in context. Situations can be extremely detailed and can work in related groups to cover a topic from many angles. Live data, particularly news, will often highlight a Situation of interest but show gaps in the source data. Historic data can be added to the dataset at any time; this enhances and does not disturb the process.

Some of the data visualization tools are still under development or refinement and the system has never been applied to BI, but the general output of the CSM prototype with regard to threat assessment is thoroughly explained in Park and Fables (2006), subtitled "Output of the CSM." In this paper the developers explain the application of the CSM to Indonesia, particularly Aceh. Aceh is a special territory of Indonesia, and the Acehnese are ethnically separate from the rest of Indonesia. They have fought against foreign dominance almost continually since 1849. The CSM presents these and many other issues from multiple points of view, such as the Acehnese people, the Indonesian government, the Indonesian military, the Free Aceh Movement, international radical Muslims and Jihadists, and various non-governmental organizations.

They explain that in their example the construct for Indonesia showed a high degree of inter-relatedness between the government, the military, politics, and business, resulting in a specialized cultural construct based on that inter-relatedness. The initial waveforms and pair correlations were analyzed with particular attention paid to known periods of instability for both current and past events. This allowed the capture of additional vocabulary and Actors that were active in and around periods of instability. Short term (two to ten day) spikes in waveforms in advance of a number of bombings were highlighted, leading the operators to fill in some related data gaps. These additional events were processed to see if the corresponding waveform peaks were consistent. They were, bringing to a total of six the number of bombings that were preceded by Indonesian court actions. This non-obvious association can then

be set up to trigger an alert when the precursor waveform hits a threshold. Given the consistency of the indicator this situation was flagged for further study. The next step would involve identifying an appropriate model to further the analysis, selecting and shaping the data to fit that specification, and passing it shaped data.

The system develops as one of its outputs a concept map that illustrates the relationship of the U.S., the Indonesian government, the Indonesian military, Exxon Mobil, and the Acehnese people, highlighting related items and behavior sequences, and recognizing patterns that, when encountered in the past, have led to certain outcomes and can be logically expected to lead to similar outcomes if they occur again. The CSM map is too large to reproduce here, but it can be viewed in Park and Fables (2006). Situation analyses and advanced data visualizations are also produced by the system. Silverman, Bharathy, and Kim (2009) also discuss the output of the CSM.

LIMITATIONS AND ADDITIONAL CONSIDERATIONS

Why is a tool like the CSM even needed? The most obvious and intuitive method of obtaining cultural information is to simply to ask subject matter experts (SMEs) to provide this information in a specified format for the regions of interest. Information can be gathered directly from the best available country experts, tapping their expertise by means of a survey questionnaire or by conducting open-ended interviews (Silverman et al., 2009).

Silverman et al. (2009) point out three main difficulties associated with using subject matter experts to gather cultural information. First, conducting interviews with experts in either form – expert survey or open-ended interview – requires significant financial and human resources. This method of collecting information can be costly. Obtaining SME expertise for a regional assessment may be prohibitively complicated and expensive. Second, subject matter experts, by definition of being subject matter experts and by virtue of being human and therefore fallible, may sometimes provide biased and, sometimes, even blatantly incorrect information (Tetlock, 2005). To limit this bias, multiple SMEs should be consulted on any particular country or topic. More importantly, being a country expert does not mean that one has complete and comprehensive knowledge; a country expert cannot know everything there is to know about a country. Third, finding subject matter experts for a particular country or region of interest may by itself pose a significant challenge. While social scientists, historians, and area studies scholars with specific country expertise are not in short supply, their expertise is not evenly distributed around the globe. Certain parts of the world and certain countries are accorded disproportionate attention, while others are relatively neglected. As a consequence, while at first this most direct route of gathering cultural information from experts looks easy and straightforward, it is also beset with difficulties.

That said, the purpose of the CSM technology is not to replace human analysts, but rather to facilitate the human analyst in finding meaning in the vast, chaotic sea of information available daily in the media. A tool like the CSM can assist in the aggregation and analysis of information, and may in fact become a necessity. The complexity of the relations between various ideas and Actors is too great to be thoroughly understood by looking at an isolated set of indicators over a period of time. Whereas it was possible up to a decade ago for humans to handle the information load with analog methods, it is becoming increasingly difficult to proceed without machine assistance for a number of reasons. First, the view of the current state must be refreshed constantly because in today's world the meaning of information is plastic and subject to an evolving interpretation. In fact, information can be interpreted, reinterpreted, and acted upon with each daily circle of news from around the globe. Second, the volume of information generated daily has grown exponentially. In the area of cultural assessment, the need to keep pace is especially significant given that having an understanding of current state is

the readiness phase for anticipation, projection, or prediction. Without this understanding, a firm ground upon which to build models and simulations for application to threat assessment cannot be established.

While the CSM was initially intended to serve as a terrorism threat assessment tool, it has recently been made commercially available, with the system being marketed as custom business intelligence software. Depending on the client's needs, a subset of the CSM can be customized for the project. Once customized for the field of use and the client, support is by contract, typically relying heavily on IndaSea's expertise initially and then migrating to the client as required and needed.

The CSM is a stand-alone solution that is a separate source of business intelligence. The system uses patented autonomous data handlers to establish a true modular data flow system operational on multiple levels. New function modules are regularly added, which are then arranged in a visual data flow manner to achieve the desired processing structure. Interfaces, data handling and processing and even data structures are handled in the same modular fashion. The system is open in that many data sources can be utilized via an evolving set of APIs. An API, or Application Programming Interface, provides a standard way for a program to accomplish a task, usually retrieving or modifying data. For example, a Twitter API was recently added so that real-time marketing campaign feedback could be included. So although the CSM can be classified as a stand-alone solution, the ability to rapidly configure a customized set of CSM modules per project or per client make provides considerable flexibility.

The ethical implications of using a system such as the CSM are the same as those associated with any information gathering and/or analysis tool designed to assist management in their decision making. No tool should be totally relied upon to produce an acceptable decision on any matter. Tools are designed to facilitate appropriate analysis of data in order to provide useful intelligence to allow managers to make decisions. The responsibility lies with management to insure that the output from the tool is used appropriately to make ethical decisions.

That said, however, ethics was a primary design consideration. The system is designed to take into consideration as many points of view as possible in order to mitigate bias by including all versions of perceptual reality available. Large amounts of data are examined to identify patterns. Ultimately, however, the decision makers would be responsible for proper inclusions of all relevant variables, and the appropriate points of view.

The CSM and similar systems are not without their flaws. There are several challenges of varying degrees of difficulty that confront such systems as discussed in Silverman et al. (2009).

(1) Both database and newsfeed coverage can be suspect. Any given country may or may not have an open, free press, so the viewpoints available and even the veracity of what is published may be called into question. Where there is a free press, one must be sure that all views across the political spectrum are captured and appropriately tagged.
(2) Another challenge lies in building the cultural construct that captures the model parameters. The main impediment lies in building a truly comprehensive and accurate catalog of concepts for the system to use in extracting information from the exponentially growing quantity of available data sources.
(3) The system's error rates must be tested. This implies assembling a test corpus in addition to a training data set where all the ground truth is known. One can then measure precision and recall rates and determine if the tool is doing a credible job.
(4) A remaining issue is how to weigh all the evidence collected to assess its reliability, and transform it into actual parameter estimates.

Such challenges are faced by any information gathering tool, and oftentimes success can only be measured over time.

FUTURE RESEARCH

A future study will examine more closely the complexities of trying to incorporate cultural sensitivity into the BI process, taking into account issues such as cross-factor interactions. This complexity can increase exponentially by an order of magnitude in a diverse, global BI analysis situation in comparison to one being played out in a more homogenous domestic cultural situation.

In addition, while it has been posited that the CSM can prove useful to BI efforts, it was, in truth, developed for threat assessment and not as a BI tool. As a result, its relevance to BI must be systematically assessed.

CONCLUSION

The purpose of this paper is not to convince the reader that the CSM is the solution to all global BI problems, but rather to point out the importance of considering cultural issues both in the information gathering and information analysis phases. The CSM, however, has proven to use an intriguing approach to cultural awareness. If such approaches are of use to governments in increasing awareness of terrorist threats arising from specific cultures, it seems that such cultural awareness should be equally important in BI. For example, the CSM's output with respect to Indonesia points out possible conflicts of interest between the reform of the Indonesian military and the interests of Exxon Mobil, whose subsidiary operates the largest gas field in the world in Aceh and utilized the Indonesian Military to guard a natural gas field.

Such facts are pertinent and in fact critical when an organization is operating in international markets. Such facts may or may not be noticed by subject matter experts, but the availability of a tool like the CSM can facilitate human experts in both the gathering and the analysis of cultural considerations. BI can benefit from a tool that monitors social interaction on a global basis. The capability to rapidly discern patterns and trends is essential, and an automated synthesis of live and historical information expedites such efforts and helps reveal the best paths forward for analysts, planners, and decision makers.

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