Creating Business Intelligence upon Conflicts

Lung-Hsing Kuo, Hsieh-Hua Yang, Wen-Chen Hu, Miao-Kuei Ho, Hung-Jen Yang

Abstract—Business Intelligence (BI) represents the ability to look into the core of a business, in order to fundament the most effective and profitable decisions. An operational BI system sustains daily activities through the following functionalities: real-time informing, secured access to information and easy to use analysis. This change is a natural response of a passing to a new organizational culture of management based on measurable objectives. An operational BI system assumes tracking down trends, problems and other factors as soon as they act, allowing employers to solve them in real time. There is a need to continually adjust business intelligence based upon certain cruses. A conflict-map proposed in this study could be used on the purpose of formulating BI. The intent of this study was to focus on operating conflict-map to inform readers of the potentials as well as the limitations of formulating BI.

Keywords—Conflicts, Conflict-map, Business Intelligence

I. INTRODUCTION

A conflict can be understood as an incompatible interaction between at least two actors, whereby one of the actors experiences damage, and the other actor causes this damage intentionally, or ignores it. Conflict analysis can support orientation for future action. Conflicts are dynamic systems. Any intervention becomes part of the system and should focus on supporting the creative, positive energies, in the system or related to the system. In this Information Age, corporations have at their disposal enormous amounts of data collected in transactional systems. These systems are designed for the well-organized selection, storage, and retrieval of data, and are vital for businesses to keep track of their relationships.[1-7]

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Having data is not the same as having information. The challenge is in deriving answers to business questions from the available data. This wealth of data can yield critical information about a business, so that decision makers at all levels can respond quickly to changes in the business climate.

The information called business intelligence, BI, should be presented in a certain structure and verified, so it can be trusted and operated[8]. Conflict analysis can be used individually or in a participatory manner in a group. The analysis does not lead to an objective understanding of the conflict. Rather it makes one's subjective perceptions transparent. This way they can be reflected on and clearer communicated. The information from conflicts could be a foundation of creating business intelligence.

II. BI FORMULATION

Aggregating data into levels at which patterns can come into view, ordering levels into hierarchies to support drilling down and up through the levels, and using investigative functions such as lag, moving total, and year-to-date are among the techniques used to transform data into information. This information can provide a major boundary in a competitive marketplace.[9]

Formulating a business intelligence requires careful planning to assure that it meets expectations. These are the basic steps:

- Identify Rationale
- Identify the Data Sources
- Design the Hypothesis Data Model
- Create the Data Store
- Verifying the Model
- Generate the Summary Data
- Prepare the Data for Client Access
- Grant Access Rights
- Distribute the Client Software and Documentation
- Create and Distribute Reports

A. Identify Rationale

It is important to anticipate how end users will analyze the data. By interviewing key users, you can identify the questions that the business intelligence system needs to answer.

One can ask questions such as:

- What information do you have now?
- What additional information do you need?
- How do you want the information presented?

Table 1 Sample requirements might be addressed

Department	Requirements
Board of Directors	Competitive analysis Key indicator tracking Trend analysis Exception reporting
Administrative Analysis and Planning	Investment and acquisitions assessment Reorganization analysis Long-range planning Resource allocation Capacity planning Human resource planning
Finance Department	Budgeting Consolidation Variance analysis Financial modeling Cash management Asset liability modeling Activity-based management
Sales and Marketing Department	Product profitability Customer profiling Distribution analysis Sales performance and effectiveness

Business requirements can be generated at all levels of an organization. In Table 1., items listed are examples of the requirements one might need to address.

One can find out about the reports and data sources currently available, and what users like and dislike about their current information system. One may also discover what expectations they have about run-time performance.

B. Identify the Data Sources

From the types of questions that end users want answered, one can identify the sources of the data that can provide the answers. The data can be distributed among numerous locations, such as transactional databases and flat files. If the data is not available within your company, then you should discuss whether it is possible to acquire the data or whether end users must modify their expectations.

C. Design the Hypothesized Data Model

The logical data model must support the needs and expectations of your end users. This layer of metadata presents the data in business terms so that users can quickly identify the data they need to use.

For OLAP tools, you define dimensions, measures, and so forth. Then you can map the metadata objects to the physical data sources. For relational tools, you define items, calculations, joins, and so forth using any existing relational data source

There different ways for define a data model, such as dimensions, levels, attributes, hierarchies, cubes, or measures.

D. Create the Data Store

One must deploy the data model as physical objects in the database and load the data from its sources.

For OLAP tools, the data store is an analytic workspace. For relational tools, the data store may be the current OLTP system or a star schema in a data warehouse.

E. Verifying the Model

According the existed data, a statistical test should be conducted for verifying the proposed model. Whether the model is robust ? Whether the model is fitting into the data stored? These questions should be answered before further applying the proposed model.

F. Generate the Summary Data

Business intelligence data is essentially hierarchical, so that data can be summarized at various levels. For performance, some of this data (ideally the data most frequently queried) is summarized and stored as a data maintenance procedure.

In analytic workspaces, summary data is stored in the same analytic workspace objects as the base-level data. In relational schemas, summary data is stored in materialized views.

G. Prepare the Data for Client Access

The client tools query the metadata to find out what data is available, where to get it, and how to present it.
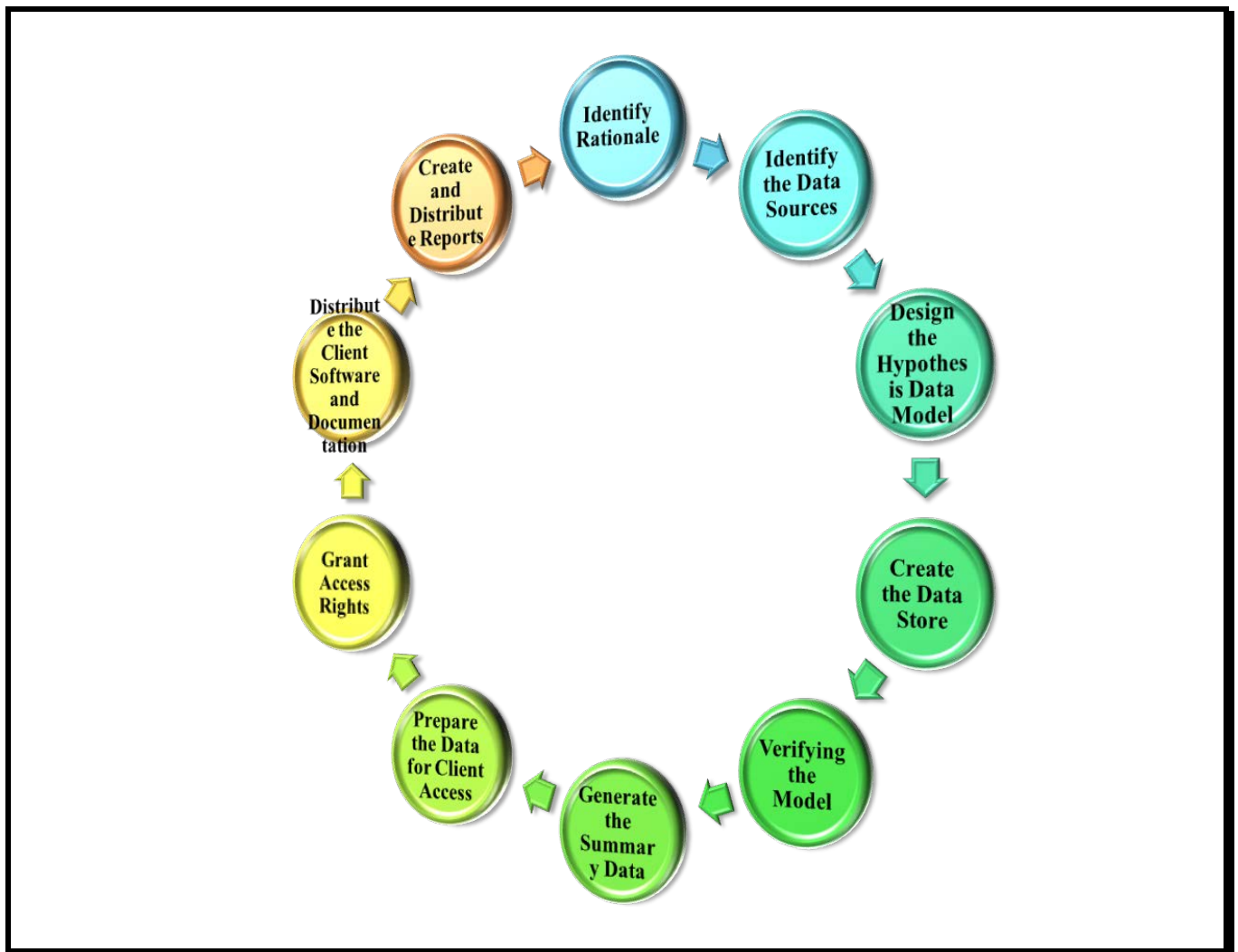
Fig. 1 A Cycle of BI Formulation

H. Grant Access Rights

Users must have database access rights granted to them so that they can view and manipulate the data. BI should be extremely protected based upon access rights and ensuring right information for right person through right authority procedures.

I. Distribute the Client Software and Documentation

After the data store is ready for client access, you can distribute the software and provide documentation to your end users.

J. Create and Distribute Reports

Report developers can develop reports and share them with the user community. For reports created in Discoverer Plus, you can create a dashboard where reports can be published.

Business intelligence provides answers to basic questions such as:

- "What are call-center top five questions?"
- "How do a call-center works this year compare to works last year?"
- "What is the 3-month moving average of call-center works?"

Business intelligence can also answer more probing analytical questions such as:

- Why are services down in this region?
- What can we predict for call-center's working load next quarter?
- What factors can we alter to improve the services forecast?
- How will our margins improve if we run this promotion?

Answering these questions requires an analysis of past performance, so that key decision makers can set a course for their businesses that will improve future performance, provide

a more competitive edge, and thus enhance profitability. There is a certain way to formulate BI.

III. CONFLICT ANALYSIS

Structural equation modeling, SEM, has gained popularity across many disciplines in the past two decades due perhaps to its generally and flexibility. As a statistical modeling tool, its development and expansion are rapid and ongoing.

To design an effective intervention into a conflict, one must be able to identify and analyze all facets of the conflict and accurately diagnose the cause or causes. Oftentimes, conflict situations are so convoluted that crucial aspects are overlooked or linkages between dynamics are not evident. Interveners must essentially decipher a conflict if they are to determine the causes and attempt a resolution. Assessment guides are useful in navigating conflicts and helpful in outlining all the various facets. Using a guide, interveners can map conflicts and conduct in-depth analyses[10]. This facilitates the process of designing appropriate interventions.

A conflict can be understood as an incompatible interaction between at least two actors, whereby one of the actors experiences damage, and the other actor causes this damage intentionally, or ignores it.

Conflict analysis can support orientation for future action. Conflicts are dynamic systems. Any intervention becomes part of the system and should focus on supporting the creative, positive energies, in the system or related to the system. Conflict analysis can be used individually or in a participatory manner in a group. The analysis does not lead to an objective understanding of the conflict. Rather it makes one's subjective perceptions transparent. This way they can be reflected on and clearer communicated.

Conflict analysis can involve: 1) verifying if one is dealing with a conflict, 2) determining the conflict system boundaries, with the option of revising these later on, 3) using conflict analysis tools (presented below) to focus on certain aspects of the conflict and organize information.
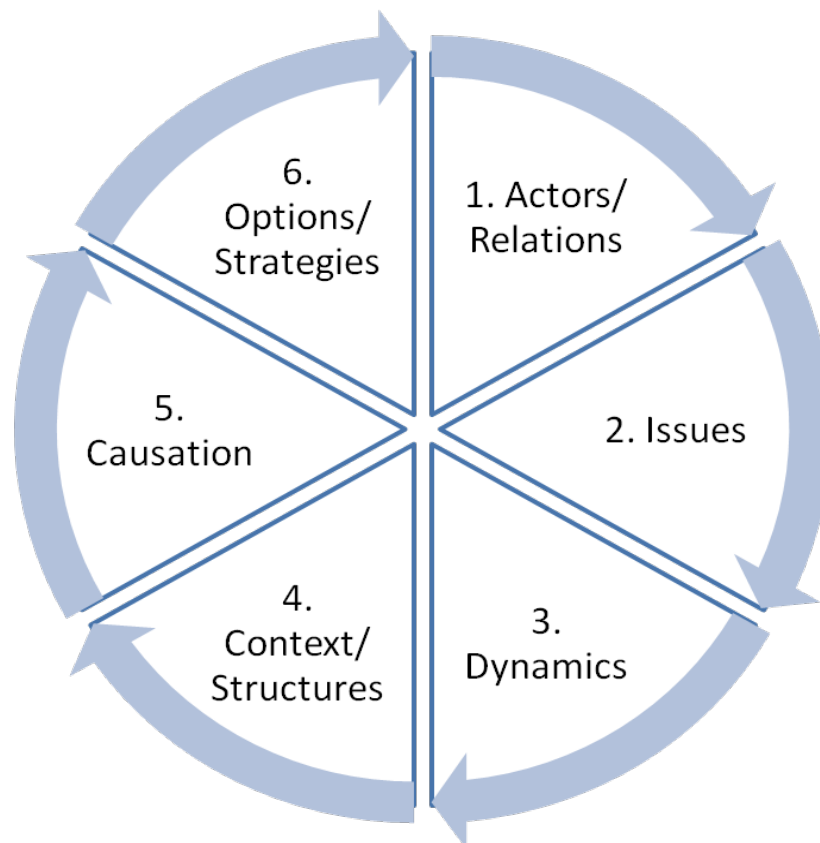

Fig. 2 Conflict Map Structure

A.Conflict Wheel

The conflict wheel is a "meta" conflict analysis tool, introducing the others tools. Each of the six sections of the wheel can be further analyzed using tools presented below (or references to other Tip Sheets). The Wheel gives a first overview of a conflict, before analyzing specific aspects. The Wheel symbolizes wholeness and movement, once the various aspects have been examined, they need to be brought together again, to get the conflict analysis "rolling".

1. Actors/Relations:

Actors or "parties" are people, organizations or countries involved in a conflict. If they are directly involved in the conflict they are called "conflict parties", if they become involved transforming the conflict, they are called "third parties". Stakeholders have an interest in the conflict or its outcome, but are not directly involved.

Conflicts by definition refer to frictional relationships between parties.

2. Issues are the topics of the conflict; what people discuss or fight about.

3. Dynamics refer to the escalation level of the conflict, the intensity of interaction, the "temperament" and the energy of a conflict that transforms people.

4. Context/Structures:

The conflict context and structural factors are often outside the conflict system one is looking at. Structural violence refers to violence that is not directly caused by people, but by the economic and political systems in place, e.g. causing poverty.

5. Causation:

Conflicts are never mono-causal, but multi-causal and systemic factors interact. Instead of saying that everything is related to everything, it is helpful to differentiate between different "causes" or influence factors.

6. Options/Strategies:

This point examines ways to deal with the conflict, strategies that are used or could be used, conflict party or third party efforts to de-escalate the conflict.
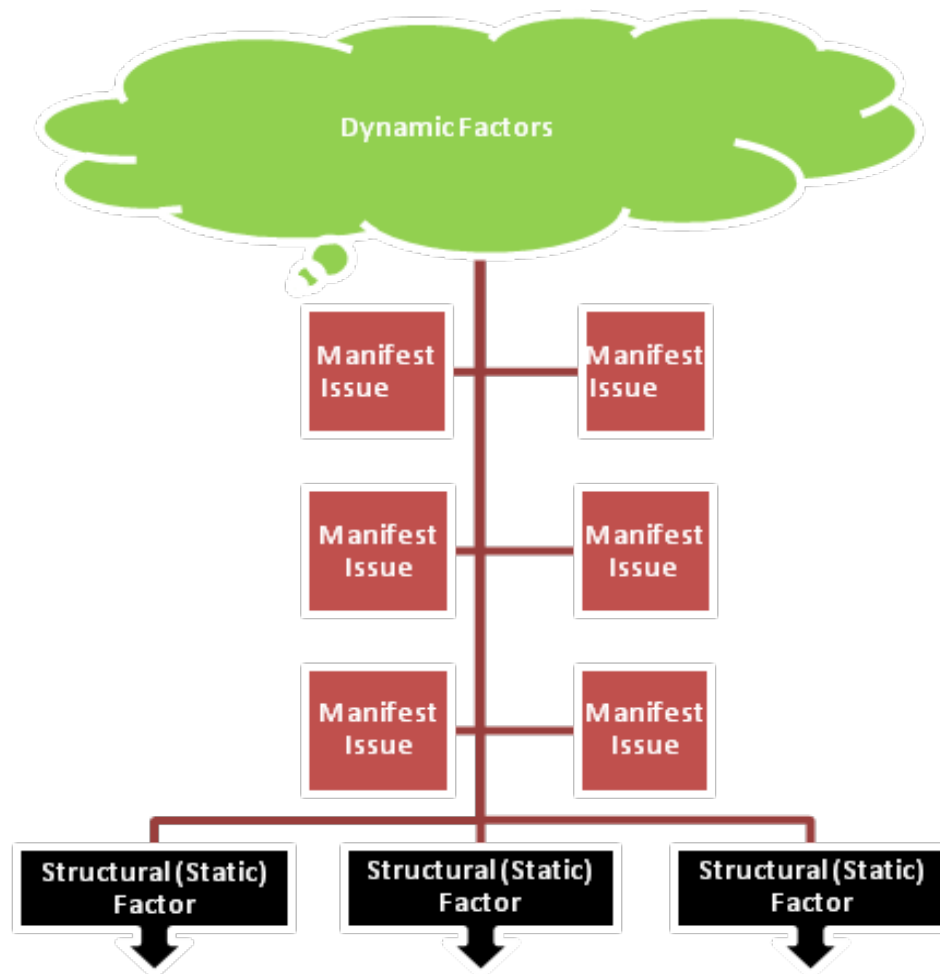

Fig. 3 Conflict Tree

B. Conflict Tree

The conflict tree is a visualizing and sorting tool. The tree visualizes the interaction between structural, manifest and dynamic factors. The roots symbolize structural "static" factors. The trunk represents the manifest issues, linking structural factors with the dynamic factors. The leaves moving in the wind represent the dynamic factors.

Dynamic factors include the form of communication, escalation level, relationship aspects etc. Working with dynamic factors involves a short time horizon; reactions to interventions are quick and at times unpredictable. Examples are diplomatic interventions, or multi track conflict transformation dealing directly with the form of interaction between the conflict parties. Quick money is often more important than big money when addressing dynamics factors.

Manifest issues are what the conflict parties want to talk about, the "topic" of the conflict. Structural Factors, root causes, are the basic "reason" of the conflict. They are difficult to influence on a short time basis, if they are avoided, however, the conflict may pop up again later. This is the typical area for development cooperation, longer-term involvement and the prevention of structural violence.

C. Conflict Map

The aims of a conflict map are to clarify relationships between actors, to visualize and reflect on the "power" of various actors, and to represent the conflict on one sheet of paper, to give a fist conflict overview.
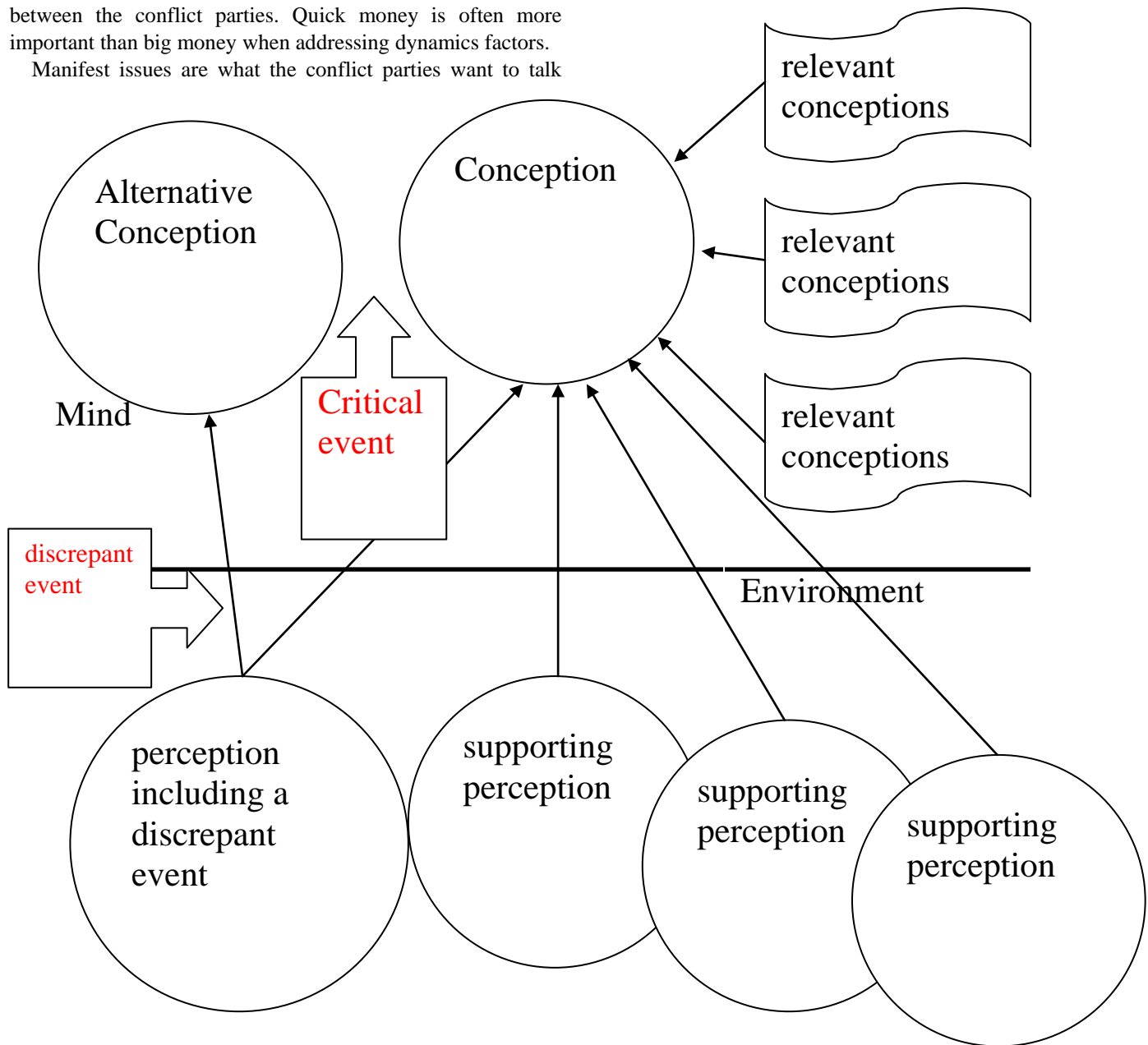
Fig. 4 The framework of a conflic map between mind and environment

D.Theoretical frameworks

Whenever a conflict could be found, it is suggested that some alternative conceptions exist. The BI should be experienced with conceptual change. Four conditions for conceptual change were proposed.

1. There must be dissatisfaction with existing conceptions.
2. A new conception must be intelligible.
3. A new conception must appear initially plausible.
4. A new conception should be fruitful or open to new areas of inquiry.

Chinn and Brewer [11] concluded that there are eight possible responses to anomalous data:

1. Ignoring the data.
2. Rejecting the data
3. Professing uncertainty about the validity of the data.
4. Excluding the data from the domain of the current theory.
5. Holding the data in abeyance.
6. Reinterpreting the data.
7. Accepting the data and making peripheral changes to the current theory.
8. Accepting the data and changing the theories.

Among these, seven responses involve discrediting the anomalous data in order to 'maintain' the original theory. The characteristics of prior knowledge, the characteristics of the new theory, the natural of the anomalous data and processing strategies may influence how people respond to anomalous data. Establishing business intelligence is a difficult process to be achieved as it may require radical restructuring of existing schema or cognitive structures.

E. The conflict map

The use of conflict map assert that two conflicts should be resolved during the process of conceptual change: one between the new perception and customer's alternative conception (conflict 1); the other one between customer's alternative concept and concept (conflict 2). The resolution of conflict 1 does not necessarily resolve conflict 2. Conflict 1 could be resolved through discrepant events and the resolution of conflict 2 could be achieved through using 'critical events or explanations' and relevant perceptions and conceptions that explicate the conception. Fig. 3 shows the framework of a conflict map.

F. The use of conflict map as a BI formulator

The use of conflict map as an BI formulator is included in proposed sequence: discrepant perception, target concept, critical event and explanation, relevant concepts and finally supporting perceptions. This sequence is consistent with Posner et al.'s [12] conditions of conceptual change.

The discrepant event in the conflict map could fulfill Posner et al.'s first condition for conceptual change. The communication of target concept could be fulfill Posner et al.'s second condition. The third condition could be possibly achieved when the critical event and relevant concepts (i.e.,

relevant concept in fig.3) are communicated. Other perceptions that are related to the target concept could be possibly help customer achieve the fourth condition.

The use of the conflict map also concurs with the framework proposed by Chinn and Brewer [13] that conceptual change mainly depends on the characteristics of the anomalous data, prior knowledge, and the new conception as well as customers' deep processing strategies. The communication guided by the conflict map integrated the presentation of anomalous data, prior knowledge, the introduction of the new conception, and the communicating sequence may possibly also help customers involve in deep processing. The ideas of conflict maps are still based upon the paradigm of 'cold' conceptual change, a rational lens with which to view conceptual change.

However, it is expected that the use of conflict maps could help creating BI of seek a stable and desirable equilibration between the conceptual schema customers' have already assembled and the perceptual information arising from the environment. The clarification as well as the connections among relevant alternative conceptions and customer's ideas are also explored and emphasized. As a result, this study explored not only the effects of using conflict map on BI creating, but also its effects on customers' ideational networks about the target concept.

G.System for conflict assessment

The nature of systems makes it particularly effective for analysis of difficult, recurrent or intractable conflicts whose solutions is not obvious and that involve complex issues and a need for multiple actors to coordinate and see the "big picture," not just their part in it. Many conflict analysis frameworks are "static," providing only a snapshot, often piecemeal, of a situation without showing feedback or cross-factor interactions over time. While acknowledging the need and utility of analyzing components of a system, system of conflict assessment could help analysis address or avoid these shortcomings of traditional frameworks for conflict analysis and the consequences of using them exclusively.

1. Fragmented programming;
2. Biased, narrowly focused and partial analysis, designed to justify the need for one's own expertise or favorite approach or methodology;
3. List-making without prioritization or dynamics, resulting in information overload and failure of many programs to achieve relevance or real effect on peace; and
4. Lack of effective integration and use of analysis in program and strategy development, resulting in a gap between analysis and programming.

Good assessment tools should capture the richness and complexity of a conflict context in order to give a broad overview of the environment a business trying to affect. It is important to gain a more comprehensive understanding of the conflict dynamics, including:

● The key driving factors
● The relationships and dynamics among factors

The key actors who have significant influence on the

conflict dynamics

If assessments cannot produce such a comprehensive, multi-faceted picture of the forces driving conflict, and an understanding of how the factors interact and relate to each other, it will be difficult for business to work in an integrated fashion. Assessment tools that us systems mapping- the graphical representation of a systems analysis- can help produce a comprehensive, cross-sector analysis that identified how various factors in different sectors interact. System

analysis can integrate both causes of conflict and actors because it examines the dynamics between the structural and proximate causes of conflict, triggers and actors and their agendas and behaviors.

Fig. 5. A Cycle of BI Formulation upon Conflict Map

Systems analysis requires the analyst to look for interconnections among parts of a system in order to track causal relationships that form feedback loops. The basic building blocks of systems mapping are as follows:

Key driving factors. Conflict analysis is likely to generate a multitude of factors, many of which are interconnected in many different ways. Generally, only the most important factors are mapped in a systems map. A key driving factor is an element or dynamic without which the

conflict would not exist or would be completely different. One can test the importance of a system's elements by imagining what would happen if it were changed or eliminated.

Interconnections (or links). From any element or factor, one can trace arrows that represent the influence it has on another element. Variables can move in the same direction (e.g., an increase in A's level of arms leads to an increase in the level of threat felt by B); they might both increase or

decrease. The variables can also move in opposite directions (e.g., an arms buildup by B may lead A to have less trust in B). These links form the building blocks of cycles, or feedback loops, which characterize the various dynamics of the system.

Feedback loops. A feedback loop is a chain of causal connections from a factor or element that comes back to affect that element. There are essentially two kinds of feedback in a system. A reinforcing loop refers to a dynamic in which most of the factors build on each other, each one contributing to or augmenting an overall dynamic of exponential growth. If the growth is positive, it is a virtuous cycle; if it is negative, as in conflict escalation, it is a vicious cycle.

Two further dimensions are important to understanding and mapping a system:

Delays. Systems are characterized by time delays—that is, the effects of various causes or elements often take time to play out (and therefore are not always visible). Delays often cause decision makers to overreact or under react. There will, for example, be a delay between the time a thermostat activates a boiler and the time the room reaches the desired temperature. A decision maker who feels cold may wait a few minutes for the room to heat up, but, still feeling cold, will push the thermostat up 10 degrees. The room warms up nicely, but soon the decision maker is sweating. Similarly, in the above example of dialogue processes between B and A, the effects of dialogue on trust may take some time, yet policy makers and funders may withdraw support before the mechanism is able to make its impact. Analogous sequences of events are frequently observed in policy-making.

Mental Models. In addition to other kinds of factors, important elements of a systemic conflict analysis are the mindsets or ways that people think—called "mental models" in the systems thinking world (or "frames" in communication theory). These often determine how and what we perceive, and are a powerful yet hidden aspect of a system. For example, a mental model underlying the arms race might be "overwhelming force will deter" or "we will not survive if we do not dominate."

H. Forward into Business Intelligence

Analysis should be the starting point for the design, monitoring, and evaluation of conflict and development BI. Conflict mapping could be part of formulating business intelligence. These are the basic steps:

- Identify Rationale based upon conflict map
- Identify the Data Sources upon conflict map
- Design the Hypothesis Data Model
- Create the Data Store
- Verifying the Model
- Generate the Summary Data
- Prepare the Data for Client Access
- Grant Access Rights
- Distribute the Client Software and Documentation
- Create and Distribute Reports

IV. CONCLUSION

This study proposed a procedure for formulating business intelligence upon conflict map. Business Intelligence (BI) represents the ability to look into the core of a business, in order to fundament the most effective and profitable decisions. An operational BI system sustains daily activities through the following functionalities: real-time informing, secured access to information and easy to use analysis.

An operational BI system assumes tracking down trends, problems and other factors as soon as they act, allowing employers to solve them in real time. There is a need to continually adjust business intelligence based upon certain cruses. A conflict-map proposed in this study could be used on the purpose of formulating BI.

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