A Competing Values Approach to Business Intelligence

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Abstract - *A successful business intelligence implementation may mean different things in different organizations. There is no best practice for (a) identifying what a successful business intelligence implementation means to different organizational units, (b) the discovery phase of current state, or (c) the methods to get to desired state based on (a) and (b). Within every organization, there is both an overarching organizational culture as well as differing occupational cultures per division. Identifying organizational cultures has been a function of the Competing Values Framework (CVF), and should also be mobilized for occupational cultures. There are a number of success factors for a business intelligence implementation, not the least of which involve organizational culture, but a gap in the literature exists here. What of occupational cultures? How might the CVF apply to specific occupational cultures within the organization, and can it provide a quantitative guide to understanding what a successful BI implementation means to those different occupational cultures?*

Keywords: competing values, business intelligence, organizational culture, occupational culture, data-centric culture

1   Introduction

A successful business intelligence implementation may mean different things in different organizations. Companies have an organizational culture that is unique to the particular business they happen to be in, and divisions within a given company vary in what occupational cultures are represented. Further complicating the situation is the tendency to believe that a particular vendor or software package can solve all the analytics needs, without any foundational work prior to or parallel with implementation [1]. A seminal 2011 study noted that improper data governance, low quality of data, and the inability to understand where to start are more typical problems of business intelligence implementations than the technology itself [2].

Organizations are not monolithic entities. The various occupational cultures within have unique priorities on processes and outcomes. In turn, a successful business intelligence implementation and move to a data-driven culture may have multiple meanings across the different organizational divisions. There is no best practice for (a) identifying what a successful business intelligence implementation means to different organizational units, (b) the discovery phase of current state, or (c) the methods to get to desired state based on (a) and (b).

2   Key Literature

2.1   Business Intelligence

The concept of business intelligence has evolved from the early days of codified decision support systems that were driven by primitive data stores to the high-end analytics and machine learning capabilities at present in various business intelligence packages. The actual phrase *business intelligence* emerged in the 1990s; by the next decade, *business analytics* had emerged to describe a key component within business intelligence [3]. On-premise data infrastructure supported data warehouses, data marts, corporate information factories, and OLAP cubes as the means of storing, extracting, and making sense of company information [4].

The shift to web- and cloud-based data infrastructure over the past two decades has, among other things, driven two specific lines of innovation: first; it has freed companies of the usual constraints of on-premise solutions [5]; second, the advent of vast amounts of unstructured data pouring into these expanded data stores has bolstered next-generation business intelligence [3]. The cumulative developments over the last thirty years have led us to this point: business may be awash in data, but they are sometimes starving for useful information.

A 2011 industry study confirmed that notion and found that the obstacles between connecting these two dots are not technical. Six in ten respondents reported their organization has more data than it knows how to operationalize; beyond that, "managerial and cultural" obstacles are the most cited impediments to making analytics work better for the business [2, p. 23]. A number of maturity studies have pointed to cultural factors as critical success factors in business intelligence implementations for many reasons, not the least of which is the basic need for a truly integrated and trustworthy store of data the analytics functions can build upon [2, 6-9]. If disparate data across the organization being brought into an integrated data warehouse environment for the good of the organization is the practical manifestation of a data-driven culture, these same principles applied to the organizational culture *itself* are the theoretical companion. All parts of the body must work in unison.

One threat to this unified state is the failure of decision-makers to adequately understand the needs of the business users and stakeholders before embarking on an implementation. Examples have been made of companies

choosing software vendors that resulted in disastrous financial losses [10], but a bad rollout can cost companies much more in unseen consequences. How is a million-dollar ERP package that goes largely unused by stakeholders in favor of their old Excel spreadsheets and proprietary databases any different than a million in lost sales because of a software glitch? Of course, the former is much more difficult to measure and the latter is easily found on a company's P&L; beyond that, I would argue that the unused ERP repeats the loss year after year because stakeholders repeat and internalize the same undesired practices.

2.2 Organizational Culture

Any organization has an implicit culture comprised of "fundamental values, assumptions and beliefs held in common" by its members [11, p. 2]. The culture grows as the company transitions from startup to incumbent, and new members are acclimated to the culture as they are brought into the organization. As it affects every part of member interaction and organizational operation, the culture has been cited as a critical barrier to innovation and implementation [11]. Much has been written about organizational culture, how to assess it, how to deal with it, et cetera; likewise, many models of organizational culture have emerged as researchers attempt to make concrete sense of an otherwise abstract phenomenon.

Schein [12] introduced a three-level model that has been a valuable resource in organizational analysis. The surface level of the model is concerned with artifacts, not necessarily tangible: things that represent both tacit and explicit knowledge and are most easily discovered. However, the ability to discover these artifacts doesn't assume the ability to understand their meanings. These are found in the intermediate and foundational levels. At the intermediate level, organizational goals and philosophies define "what ought to be done in an organization" and "visible and debatable with individuals" [13, p. 49]. Under that, at the foundational level, are the underlying assumptions that define belief systems, truth, behavior, and reality [12].

At the intermediate level of values and beliefs, the Competing Values Framework (CVF) focuses on these "core constituents of organizational culture" [13, p. 50]. The CVF was introduced in 1981 by Quinn and Rohrbaugh; since that time, it has served in many capacities from peer-reviewed research to industry tools and white papers [14, 15]. Its concise methodology and ease of reporting has made it a favorite of organizational culture analysts [11, 13, 16-21]. The CVF is a basic two-axis, four-quadrant system; one axis representing the change vs. stability spectrum, the other representing internal vs. external focus [13]. The two axes converge to make the four quadrants of culture: Group, Developmental, Rational, and Hierarchal [22]. The four quadrants have different names depending on the application. An organization will exhibit traits of all four, most often lean towards one or two, and exhibit these especially when it grows and experience "external environment pressure" [19, p. 90].

Büschgens et al. [16, p. 767] suggested that the CVF satisfies the need for a framework "which allows classification of values without residuals, to draw meaningful comparisons with reference to the criteria by which they are grouped, and to assess their relationship with organizational innovation." Of course, organizations do not fall neatly into one of the four quadrants, but will represent values from multiple quadrants, emphasizing one or two of them overall. They reflect all of the cultures in some fashion, depending on the time and situation [11]. Beyond the CVF, the Measurement of Behavior and Output theory helps quantify the existing implementation roadmap [23].

2.3 Occupational Culture

Whatever taxonomies may be applied to organizations, these organizations are not culturally homogenous. Previous studies have acknowledged that any organization may reflect more than one culture quadrant at any given time [11] and this is in no small way due to the distinct number of divisions within an organization having their own identities. These are occupational cultures, defined by the "values, norms, and symbols shared" by those working in a particular discipline [24, p. 20].

A prominent occupational culture is found within an organization's IT division. Jacks and Palvia [24] identified the IT division as one with a distinct occupational culture that might often be at odds with other occupations within the organization, and suggested that such a chasm might explain why IT projects either succeed or fail. The IT occupational culture is particularly at odds with business management culture by way of Reverence for Knowledge, meaning that neither the IT employee nor the business manager sufficiently respect the other's domain expertise enough to achieve IT/Business alignment [24].

3 Research Question

This study seeks to identify occupational cultures within an organization and employ the Competing Values Framework to understand how each culture views a successful business intelligence implementation. From the perspective of an industry-disrupting IT management firm, how would that firm engage a client to (a) identify what a successful business intelligence implementation means to different organizational units within a multinational company, (b) execute the discovery phase of current state, and (c) provide a roadmap to get to desired state?

4 Methods

The research will utilize a grounded theory approach. This means using observations, categorical data, and interrelationships to build a theory. Grounded theory is particularly useful in research areas that are sparse in empirical literature on "social, psychological, and cultural aspects" but with a history of quantitative data [25]. Glaser and Strauss [26] suggest that the creation of a theory is one

and the same with its adequacy—in other words, a particular theory is not adequate nor authoritative simply by its own merit. How it came to be is of equal importance. "Grounded theory can be presented either as a well-codified set of propositions or in a running theoretical discussion, using conceptual categories and their properties" [26, p. 31]. They acknowledge that the themes and categories that emerge will form interrelated patterns, forming the core theoretical principles [26].

According to Edmondson and McManus [27], this area of research is within intermediate theory. Although there is no perfectly aligned theory found to date that matches the research topic, there are applicable theories that "sit within a mature stream of research" and the researcher may use these to "modify prior work" [27, p. 1165]. It is not within the bounds of nascent theory, as neither the individual components of the phenomena nor theories are unknown.

The instrumentation involves a comprehensive Business Intelligence Maturity Assessment (BIMA) assembled from various research-based methods [2, 28]. The assessment includes three primary components. First, the qualitative interview allows participants to answer prompts open-ended and freely. Second, the quantitative assessment pinpoints specific maturity levels in different areas of BI implementation. Third, the short questionnaire gauges attitudes around reporting development and workflows, e.g. priorities and challenges.

The researcher is interested in the relationship between the scores on the CVF and the combined results of the maturity assessment and short questionnaire. These measures are the independent variables. The BI-related assessments are the dependent variables, as these numbers will vary based on organizational unit and CVF scores. The ultimate outcome is identification of key obstacles and best practices for implementing a data-centric culture. Establishing relationships between these independent and dependent variables helps to frame these obstacles and strategies in appropriate contexts. The CVF and supporting theoretical framework give us a baseline for understanding the differing subcultures within an organization. The BIMA quantifies the current state of BI within an organization. Post-implementation, the BIMA yields a comprehensive picture of what worked within the organization and what didn't, identified by the existing divisions and subcultures.

5   Relevance

By 2014, the idea of cloud-based BI services was coming in the mainstream, and one of the primary advantages of cloud architecture was the lack of physical infrastructure to maintain [5]. More organizations were shifting focus from the cost centers and deliverables of BI to how the supporting culture could enable more valuable insight. That is, BI shifted from something the organization *drew from* to an asset the organization *fed into*. But the shift in how to think about the data itself represents a smaller portion of a larger cultural change. It is a matter of interplay between culture and BI. Sweetwood [29] sums it up thusly: "The problem is

that while marketers are thinking differently about their data, in many cases they're not acting differently based on what the data is telling them."

This is within the meta-BI domain; that is, it is not actually about delivering specific analytics insights, but about crafting how the organization supports analytics efforts and arrives at them. Think of this analogy. In the book *The Death of Expertise*, Nichols [30] discusses the importance of our metacognitive ability—that is, the ability to think about our thinking. It is the wisdom and ability to evaluate our own shortcomings, thought patterns, logic, and biases. It's one thing to not know something, but *not knowing that we should, and don't, know something* (i.e., willful ignorance) is rather dangerous.

Take that same situation and apply it to the meta-BI domain. An organization that is not mature enough to identify its incredibly pedestrian BI culture is at a much greater disadvantage than one that understands its own shortcomings and room for improvement/enhancement. In fact, every major maturity index includes an assessment of the organization's data-centric culture.

Such maturity indices have already made a significant contribution to the field in allowing organizations to codify their adoption progress and speak a common language about BI implementation [2, 7]. As culture is a significant part of adoption and maturity, these go hand in hand. Organizational culture has already been a popular topic for a long time, particularly around leadership circles, but the deeper dive into divisional occupational cultures, at the confluence of culture and analytics, is a new research area ripe for further research and knowledge creation.

6   References

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