The influences of competitive intelligence budgets on informational energy dynamics☆

Gabriela Opait, Gianita Bleoju, Rozalia Nistor, Alexandru Capatina *

Dunarea de Jos University of Galati, str. Domneasca, no. 47, Romania

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ABSTRACT

This study presents a statistical analysis on the Competitive Intelligence (CI) budgets of a software development company by considering two main components of this budget: Competitor analysis and industry trends analysis. This research seeks to improve the financial management decisions on competitive intelligence budgets, which may reinforce the strategic positioning on dynamic and challenging environments. Building on organizational modeling, this study presents an analysis framework that combines organizational theory and statistical analysis to examine the influence of financial resources allocation. This study expands previous abductive-method-based research by using Onicescu's informational energy theory to the Romanian software industry. The results reflect changes in strategic priorities through financial reconfiguration consistent with the environment instability, thus supporting the CI profiling model that this study presents. In addition, the results show the relevance of Onicescu's informational energy theory in CI budgeting.

1. Introduction

This research seeks to provide useful guiding tools for financial management decision makers through Onicescu's (1966, 1979) informational energy theory and drawing on macroeconomic and microeconomic approaches to organizational economics. This study examines firms' foresight capability by focusing on financial resources allocation and competitive behavior in the software sector to ensure the optimal strategic positioning in a knowledge-based competitive environment. The statistical analyses that this study performs draw on Florea's (1986) Factors Path Method.

After this introductory section, Section 2 presents a review of the literature on CI budgeting dynamics. Section 3 describes the method. Section 4 highlights the influences of CI budgets on the dynamics of the adjusted informational energy. Section 5 presents the results, and section 6 offers a discussion and further research options.

2. Theoretical background

The capability to design an organizational intelligence infrastructure drawing on the ability to predict change and understand the risk enables a knowledge-based competitive position. Therefore, to achieve strategic differentiation, the management must set the appropriate internal control measures, as well as the specific intelligence strategic planning process, which are the most valuable organizational assets. As an important solution to internal control design modeling, Competitive Intelligence (CI) budgeting outlines the commitment to update the mission statement.

This approach points the need for a preparedness system (Aven, 2008). Recalling Gilad's (2001, p. 24) assertion "CI is about risk, not information," any appropriate performance management framework must adjust its environment-scanning priorities depending on the specific dimensions of a foresight capability maturity model. The tool of internal control design that this study proposes relates financial allocation modeling (through CI budgeting) to profile specific performance management framework.

Literature highlights the importance of systematic documentation for the decision-making process because one of the most important managerial capabilities is financial resource allocation as a part of the process of absorbing risk's consequences (Aven, 2008).

Building on the new insights on decision-making processes, strategic intent serves as an anchoring mechanism that drives and guides a firm's subsequent resource-allocation decisions (Mariadoss, Johnson, & Martin, 2014).

Regarding the importance of CI Herring (2007 p. 26) asserts, "information costs money, while intelligence makes money. Moreover, intelligence that makes money for a company is valued intelligence" Albescu, Pugna, and Paraschiv (2008) state that a performance management system (part of strategic management support system) must fulfill its control task through the CI budget dynamics.

Leitch (2003) underlines the importance of changing perspectives about risk management through an accurate argumentation about

conflicting outcomes of budgetary control and moving to a more proactive planning, like the beyond budgeting approach requests. One major point of Leitch's approach is the incorrect assumption of the linearity in the quantitative modeling of uncertainty.

The implementation of a beyond budgeting model is an appropriate solution when trying to reconfigure performance management through internal control design so that companies can better manage uncertainty and risks. This approach is consistent with Kalb and Herring's (2012) approach of Competitive Intelligence Organizational Model, which analyses patterns for internal control design and offers relevant solutions for CI budgeting process.

Lim (2013) argues that the development of a competitive prediction capability enhances firm performance; this study calls a similar conceptual framework, exploring causal relations between propensity to competitor analysis vs. industry trends and firm competitiveness.

Capatina, Nistor, and Bleoju (2012) analyze the Romanian managers' decision-making processes regarding CI budgets' allocation and how the increasing of budgets is consistent with competitive intelligence profiling. Sandalgaard's (2012) study in the field of mitigation between conflicting budgeting and beyond-budgeting models shows a positive relationship between competition and the adoption of rolling forecasts. Thus, rolling forecast becomes a conceptual base for internal control design reconfiguration.

Seng Yap, Zabid Abdul Rashid, and Amat Sapuan (2013) demonstrate the causal relation between uncertainty and CI organizational configuration. The study finds that a positive correlation exists between perceived environmental uncertainty and CI practices, specifically in terms of intelligence acquisition and strategic use.

Onicescu (1966) is the first in introducing the concept of informational energy in an attempt to define a finer measure of dispersion distribution than Shannon's information entropy. Onicescu shows that information entropy increases when informational energy decreases (Sen, 2011). Pardo (1985) highlights the informational energy that a fuzzy event provides by integrating the statistical uncertainty resulting from the occurrence of events. In this context, the fuzzy event's functional information energy is similar to Onicescu's information energy. According to Kent and Williams (1999), informational energy is more sensitive than Shannon's entropy to modification of a system, and describes the uniformity or diversity of a system, process, or phenomenon relating to computer science. Andonie, Caţaron, and Sasu (2009) illustrate the design of a neural architecture that builds on a feature-weighting method based on Onicescu's informational energy and address the fact that each training pair has a relevance factor proportional to the importance of that pair during the learning phase. Rizescu and Avram's (2014) study on entropy outlines that, to characterize the evolution of a society, an economy, or group of countries, informational energy uses as data source the statistical measurements.

No empirical studies exist in the field of strategic behavior that focus on CI budgeting considering Onicescu's informational energy. Hence, this study applies Onicescu's informational energy model at a microeconomic level.

3. Method

The case study focuses on a Romanian company that provides custom IT solutions and services to deliver the highest value for its clients. The company's mission statement reveals its commitment to CI activities, aiming at exceeding client expectations. The main services are custom software development, software support and maintenance, mobile applications development, and consulting services.

3.1. Positioning the company into the CI profiling tool

One of the goals of this study is to find out the positioning of the company within the CI profiling tool (Fig. 1) that this study designed building on previous research (Capatina & Bleoju, 2014).

The open discussions with the company's top management and the financial data on the CI budgets' distribution (see Table 1) label the company as *vigilant learner*.

This study examines the positioning of the company in the vigilant learner quadrant. The company, as the beneficiary of a similar capability to recognize value, develops the appropriate skills to monitor the learning process on an on-going basis by monitoring the most profitable costumers. The company adjusts its internal selection environment to meet and increase expectations by applying managerial mechanisms that react to external competitive pressures.

Another distinctive feature of this company is its capacity to develop the master list of industry-specific reactive strategies to avoid any threat through an appropriate ready-to-fix solution. The company also has a remarkable absorptive capacity in terms of identifying new information (i.e., knowledge-recognizing leader) and assimilating that information through the company's transformational capacity. The company's responsiveness (e.g., risk-adverse manifest behavior) involves the design of early-warning systems to avoid any surprises, prevent competence portability, profit volatility, and improve customer value. The company's obsession for control could act as an incentive for continuous improvement in the ever-going struggle for dominance through superior customization abilities. Once the company meets this requirement, the company becomes equipped for its most appropriate strategic positioning.

3.2. Modeling the CI budgeting through coefficient of variation method

This study computes the values of the adjusted informational energy as input for the values' concentration-degree measurement by building
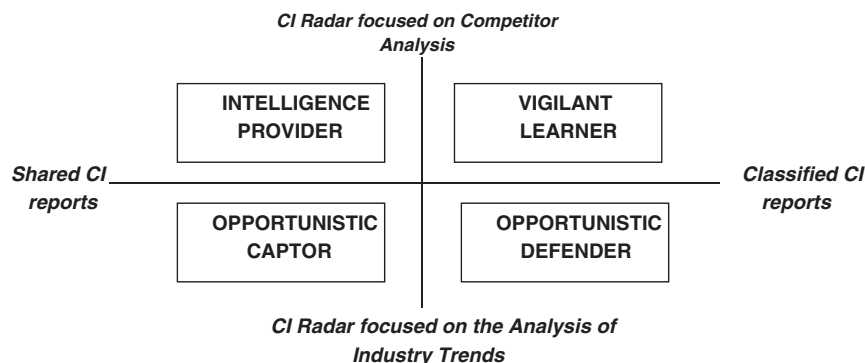
Source: Capatina & Bleoju, 2014.

Fig. 1. CI profiles of software development companies from the perspective of competitor analysis and industry trends Source: Capatina & Bleoju, 2014.