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Culture and Management Control Systems in Today's High-Performing Firms

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YOU MIGHT THINK THAT FIRMS WITH BUREAUCRATIC CULTURES WOULD EMPHASIZE THEIR USE OF MANAGEMENT CONTROL SYSTEMS. CONTRARY TO EXPECTATIONS, FIRMS WITH BUREAUCRATIC CULTURES ARE *NOT* USERS OF MANAGEMENT CONTROL SYSTEMS!

Richard Kovacevich, former CEO of Wells Fargo, once stated, "What actually provides competitive success and what is difficult to copy is not so much knowing what to do—deciding on the right strategy—but instead having the ability to *do it*."[1] That ability is found in a company's culture. Examining the links between culture and the types and uses of management control systems (MCS) may explain why users of MCS have varying levels of success with these tools in terms of performance. By finding the right combination, a company can increase its ability to learn, grow, and improve its business processes.

To take a close look at the interconnectivity of the links, in our IMA-sponsored research project we asked the following questions about culture, types and uses of MCS, and performance:

◆ What types of cultures do companies exhibit?

◆ What is the relationship between culture and types and uses of MCS?

◆ What cultures and choices of MCS characterize high-performing firms?[2]

OUR SAMPLE

To better understand the association between culture and management control systems, we surveyed attendees at the 2010 American SAP Business Objects Annual User Conference. This was an ideal opportunity to poll a large number of diverse users of a set of MCS that are common in companies today—business intelligence (BI) systems. We selected this group because SAP is one of the four largest BI vendors along with Oracle, IBM, and Microsoft. Business Objects, a BI software company owned by SAP, provides three popular types of business intelligence systems:

1. Dashboards and visualization;

2. Query, analysis, and reporting; and

3. Data management and data quality.

Business Objects users will recognize the "labels" of the three systems, and users of different BI software systems can easily conduct their own translation and comparison for the use of their systems as they go through the article.

We collected 366 survey responses, and 343 were usable. As Figure 1 shows, 98% of the respondents use the query, analysis, and reporting system; 71.7% use dashboards and visualization; and 49% use the data management and data quality system.

Figure 1: **Uses of Business Intelligence Systems by Respondents**
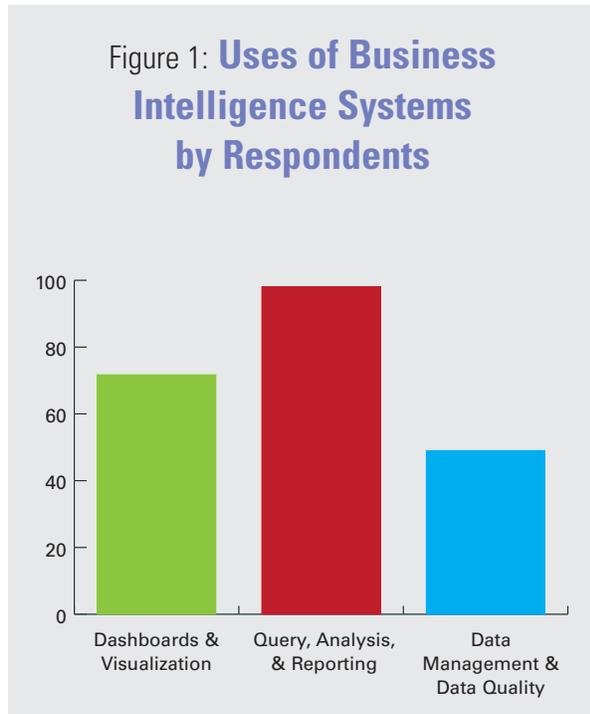
To address our three research questions, we focused on data from 150 (43.7%) respondents who use all three business intelligence systems. Figure 2, Panel A shows that the vast majority of respondents work in information technology (65.1%), 11.5% work in manufacturing, and 9.5% are in accounting and finance departments. Our respondents are directors and managers (25.3%), developers and architects (13.9%), system analysts (10.8%), business analysts (10.2%), and project managers (8.4%). As Figure 2, Panel B shows, the firm size ranged from sales of less than $250 million (16.9%) to

more than $1 billion (61.3%), with medium-sized firms (sales of $250 million to $1 billion) representing 12.7% of the sample. Some 9.2% of our respondents work in nonprofit organizations.
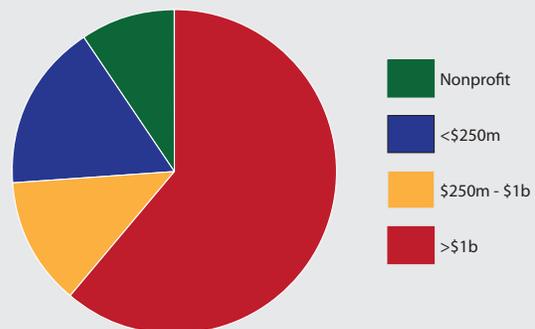
Our respondents also work in a range of industries, including healthcare (14.6%), financial services (12.3%), high-tech and electronics (12.3%), public sector (11.5%), professional services (11.4%), utilities (7.7%), insurance (6.2%), and retail (6.2%).

Figure 2: **Sample Characteristics**

Panel A–Area of Work by Respondent
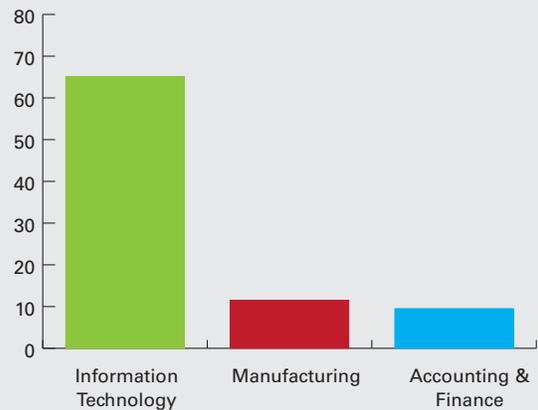
Panel B–Firm Size by Respondent

In summary, the sample we used in this study exhibits the following characteristics:

◆ The majority of respondents are directors and managers as well as team leaders from the IT department. Some responses are from manufacturing as well as accounting and finance departments.

◆ Our sample consists mostly of large firms and contains a broad spectrum of industries.

TYPES OF CULTURES

Culture is the shared value and norms of the collective organization. The Competing Values Framework provides a set of dimensions for defining culture and assumes that firms vary their internal emphases across a limited set of competing values.[3] Flexibility and control represent two competing values that define behavioral norms that are attributes of culture. Flexibility values convey spontaneity, change, openness, adaptability, and responsiveness, and control values feature predictability, stability, formality, rigidity, and conformity.

The companies displayed one or a combination of three types of cultures (bureaucratic, results-driven, and entrepreneurial) that we classified as either a "control" or a "flexible" culture. In the control category, some 37.7% of respondents report that they work in a firm characterized as bureaucratic, while approximately 50% report they work in a results-driven culture. Where formal rules and policies control the bureaucratic culture, measures, goals, and goal accomplishment drive the results-driven culture. As far as a flexible culture, some 35.3% of respondents report that their firm has an entrepreneurial culture. Its commitment to responding to opportunities, innovation, spontaneity, and a willingness to change support all the elements of a flexible culture.

TYPES AND USES OF BUSINESS INTELLIGENCE SYSTEMS

Two distinct types of management control systems are cybernetic and planning systems.[4] A cybernetic system—dashboards and visualization—provides information about measures (for example, financial measures, nonfinancial measures) and targets that allow managers to compute and monitor variations in performance.[5] To use dashboards and visualization, a company sets objectives, measures output, compares objectives, and takes corrective action if necessary. Control takes place after the event.

Two business intelligence systems provide planning capabilities to assist companies: (1) query, analysis, and reporting and (2) data management and data quality. The query, analysis, and reporting system enables users to interact with business information, pose questions, and find answers to those questions that lead to goal formulation across the firm's functional areas. It serves as a starting point to develop goals and make changes to them before the actual event takes place. The data management and data quality system provides data assessments to check and ensure that data is accurate and complete. Users also can apply a series of rules or functions to transform the data so that the information that the data provides is useful for planning, controlling, and decision making. Routinely performing assessments and transformations provides revised information that may impact planned and predicted outputs before the actual event.

In addition to various types of business intelligence systems (cybernetic and planning systems), firms may use these systems either diagnostically or interactively.[6] To employ the system diagnostically, managers use information as feedback to monitor predictable goal achievement. By setting the system on "autopilot," managers often pay attention to the information generated only when it is out of tolerance. The interactive aspect of MCS occurs when top managers use the information to seek more opportunities and expand learning throughout the organization. Typically, top managers generate information and then discuss and interpret the information with staff at different hierarchical levels in relation to the data, assumptions, and action plans.

When we inspected the data, we found four combinations of types and uses of management control systems from the three business intelligence systems. We expected to find that each type of MCS (dashboards and visualization; query, analysis, and reporting; and data management and data quality) is used either diagnostically or interactively. Instead, the data in Tables 1 and 2 shows that each type of business intelligence system has a use that includes both diagnostic and interactive aspects. The fourth type shows that all three business intelligence systems are used in combination to

Table 1: Uses of Cybernetic and Planning Business Intelligence Systems

	CYBERNETIC USE: Dashboards & Visualization	PLANNING USE: Query, Analysis, & Reporting	PLANNING USE: Data Management & Data Quality
Overall Type/Use	4.49	5.52	4.23
We use this function to track our performance.	4.55	5.71	4.37
We use this function to monitor variations with our performance.	4.41	5.61	4.31
We use this function to focus on critical success factors for our workplace.	4.49	5.35	4.18
Our top management regularly uses information from this function.	4.51	5.58	4.22
The information from this function is discussed regularly at meetings throughout our workplace.	4.44	5.38	4.11

Average Scores (Scale: 1 = strongly disagree, 4 = neutral, 7 = strongly agree)

question existing company practices.

Table 1 provides several interesting insights. First, the highest overall use at 5.52 on a seven-point scale (where 1 = strongly disagree and 7 = strongly agree) occurs with query, analysis, and reporting. The mean uses on the individual items range from 5.38 to 5.71. Respondents use query, analysis, and reporting the least for frequent and regular discussions at meetings and the most to track performance. Second, the next-highest overall use at 4.49 occurs with dashboards and visualization, followed by data management and data quality at 4.23. Third, respondents agree that they use all three systems the most for tracking business performance, but the levels range across systems. Finally, respondents generally agree that they use all three systems the least for more interactive involvement, such as in frequent and regular discussions at meetings.

Table 2 shows a fourth combination of type and use of a system with a different focus: using the information to question what is going on. This approach includes all three specific business intelligence systems. Questioning the information from query, analysis, and reporting scored the highest, while questioning the information from data management and data reporting scored the lowest. Dashboards and visualization landed in the middle.

We summarize our observations of the types and uses of business intelligence systems as follows:

◆ Companies use each type of business intelligence system (cybernetic, planning) in both diagnostic and interactive ways.

◆ The pattern of use varies by specific systems (dashboards and visualization; query, analysis, and reporting; data management and data quality) and not by type of system (cybernetic vs. planning).

◆ We cannot generalize findings from one planning system (query, analysis, and reporting) to another planning system (data management and data quality).

CONNECTING CULTURE WITH SYSTEM TYPES AND USES

Table 3 shows the correlations between cultures and the types and uses of systems for our sample. Correlation measures theoretically range from -1.0 to 1.0 inclusive and reflect the extent to which the culture, type,

Table 2: Questioning—Mixed Type of Business Intelligence Systems

	QUESTIONING: Mixed Type
Overall Type/Use	4.23
We regularly question the information from the Dashboards and Visualization function.	4.09
We regularly question the information from the Query, Analysis, and Reporting function.	4.73
We regularly question the information from the Data Management and Data Quality function.	3.94

Average Scores (Scale: 1 = strongly disagree, 4 = neutral, 7 = strongly agree)

and use of a system are interconnected. Positive signs show they are interconnected in the same way; negative signs show they are interconnected in the opposite way. The larger the positive or negative correlation measure, the more interconnectivity between them.

We expected that firms with a bureaucratic culture would rely heavily on MCS. Contrary to expectations, however, the data shows that the correlations between a bureaucratic culture and all types and uses of business intelligence systems are very low. The results suggest that firms with bureaucratic cultures are not MCS users.

The respondents who work in a firm dominated by a results-driven culture report that they rely heavily on MCS. We expected this because these firms are most likely to promote tight control of operations and highly structured channels of communication. The table shows

that results-driven firms are highly correlated with the data management and data quality system, followed by the query, analysis, and reporting system. Yet results-driven firms did not use dashboards and visualization systems as often as we expected. We thought that these firms would rely heavily on the performance information in a dashboard system because the results-driven culture focuses on measures, goals, and goal accomplishment; the dashboards and visualization system provides the necessary information to monitor variations in adherence and goal accomplishment.

The correlations between companies with an entrepreneurial culture and types and uses of business intelligence systems reveal that they are more likely to use dashboards and visualization than the other systems. Again, these results differ from what we were expect-

Table 3: Correlations Between Firm Cultures and Types and Uses of Systems

	Bureaucratic Culture	Results-Driven Culture	Entrepreneurial Culture
Dashboards and Visualization	-0.033	0.325	0.216
Query, Analysis, and Reporting	-0.080	0.369	0.149
Data Management and Data Quality	-0.032	0.449	0.113
Questioning	0.062	0.094	0.002

ing. The entrepreneurial culture exhibited a flexible culture that featured a commitment to responding to opportunities, innovation, spontaneity, and a willingness to change. Therefore, we expected that these firms would promote loose and informal controls, open communications, and free flow of information throughout the firm. The query, analysis, and reporting as well as data management and data quality systems are flexible and may better facilitate the generation of new ideas and innovation than would the dashboard and visualization system. It also seemed likely that respondents in an entrepreneurial culture would report lower reliance on dashboards and visualization than on the other systems.

CULTURE, TYPE AND USE OF SYSTEMS, AND FIRM PERFORMANCE

To determine which combinations of culture and types as well as uses of business intelligence systems lead to high performance, we first grouped the companies by the three types of cultures (bureaucratic, results-driven, and entrepreneurial). Then we calculated the average scores the respondents reported for business performance for every combination of high/low levels of the four types and uses of business intelligence systems (dashboards and visualization; query, analysis, and reporting; data management and data quality; questioning). We define high levels of types and uses of business intelligence systems as those firms that responded above the median level. High-performance combinations of culture and types as well as uses of business intelligence systems will be revealed by the combination with the highest average performance scores.

We define firm performance as the measures that are affected directly by the types and uses of business intelligence systems in our sample. High performance results if a type and use of a business intelligence system leads the company toward achieving its operational process goals. These goals include timely product and service delivery as well as customer relationship process management that minimize product and service returns and complaints. We call this outcome internal business-process performance.

Table 4 shows the culture and the 24 high/low combinations of types and uses of systems along with the average score that respondents gave internal business-process performance in their firms. The highest internal business-process performance occurs when bureaucratic

Table 4: Culture and Uses with Average Scores of Internal Business Process Performance

Average Scores for Achieving Internal Business Process Outcomes*	Dashboards & Visualization Use		Query, Analysis, & Reporting Use		Data Management & Data Quality Use		Questioning Use	
	Low	High	Low	High	Low	High	Low	High
Bureaucratic Culture	4.92	**5.52**	4.93	5.49	5.01	5.47	4.90	5.48
Results-Driven Culture	5.79	5.85	5.45	**5.98**	5.96	5.87	5.72	5.90
Entrepreneurial Culture	5.63	5.72	5.24	5.86	5.56	**5.90**	5.54	5.72

*Scale: 1 = strongly disagree with achieving internal business process performance, 4 = neutral, 7 = strongly agree with achieving internal business process performance

Table 5: Cultures and Uses with Average Scores of Learning & Growth Performance

Average Scores for Achieving Internal Business Process Outcomes*	Dashboards & Visualization Use		Query, Analysis, & Reporting Use		Data Management & Data Quality Use		Questioning Use	
	Low	High	Low	High	Low	High	Low	High
Bureaucratic Culture	5.32	**6.22**	5.46	6.01	5.46	6.01	5.56	5.97
Results-Driven Culture	6.17	6.37	6.08	**6.40**	6.24	6.37	6.33	6.23
Entrepreneurial Culture	6.11	6.25	5.76	6.37	6.06	**6.44**	6.12	6.22

*Scale: 1 = strongly disagree with achieving internal business process performance, 4 = neutral,
7 = strongly agree with achieving internal business process performance

firms use dashboards and visualization (an average score of 5.52 out of 7); results-driven firms use the query, analysis, and reporting system (an average score of 5.98 out of 7); and entrepreneurial firms use data management and data quality (an average score of 5.90 out of 7).

A company also obtains high performance when it invests in its people, technology, and environment to support continuous improvement and value-creation strategies. Known as learning and growth performance, it provides a foundation for firms to build strong decision-making capabilities, business agility, and operational excellence that ultimately lead to future financial performance.

Table 5 shows the 24 combinations of cultures and types as well as uses of business intelligence systems along with the average score that respondents provided for learning and growth performance in their companies. The table shows that companies obtain the highest learning and growth performance when bureaucratic firms use dashboards and visualization (an average score of 6.22 out of 7); results-driven firms use the query, analysis, and reporting system (an average score of 6.40 out of 7); and entrepreneurial firms use data manage-

ment and data quality (an average score of 6.44 out of 7).

These results may explain why existing business intelligence systems users have varying levels of success. To improve business performance requires a change in the choice and use of business intelligence systems. Therefore, we share some observations about cultures and the types and uses of business intelligence systems for high-performing firms.

Observation 1

If bureaucratic firms use business intelligence systems, specifically dashboards and visualization, they may achieve higher performance. Users can better track the performance of employees and their adherence to rules and policies and correct deviations. As noted in Table 3, our sample currently shows very low correlation between bureaucratic firms and all business intelligence systems overall.

Observation 2

Tables 4 and 5 suggest that, to improve organizational learning and business-process performance, results-driven firms may want to focus on the query, analysis,

and reporting system (see the higher average scores). Users can enhance their interaction with business information, pose questions, and find answers that lead to gains in organizational learning and business-process performance. Although our sample of results-driven firms shows a high correlation of 0.369 with the query, analysis, and reporting system, the companies presently seem suboptimally focused on the data management and data quality system with its higher correlation of 0.449 (see Table 3) and could shift their use to the query, analysis, and reporting system to increase performance.

Observation 3

Entrepreneurial firms benefit most from the data management and data quality system. The results in Tables 4 and 5 suggest that users' regular assessments and transformations of company data routinely provide revised information that would more than likely lead to ideas about new initiatives that can support future performance. At present, our sample shows that entrepreneurial firms and the dashboards and visualization systems are highly correlated at 0.216 (see Table 3), but they could shift their use to the data management and data quality system to augment performance as evident by the higher average scores with data management and data quality system use relative to dashboards and visualization use (see Tables 4 and 5).

IS IT A GOOD MATCH?

Because of our research, we can show that the varying levels of performance and success from management control systems, specifically business intelligence systems, come from matching cultures with the types and uses of MCS. Practitioners and academics often say that it is not the possession of MCS that creates firm performance and success but the ability of a company and its culture to use and exploit such systems in unique ways. Our research provides support for this statement. It specifically uncovers answers behind the types of cultures and the relationship between culture and types and uses of MCS that can provide firms with the ability to learn, grow, and improve their business processes. These results provide managers, users, and practitioners with a number of configurations of culture, system

choices, and uses that businesses can emulate. ∎

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ENDNOTES

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