Alignment of University Information Technology Resources With the Malcolm Baldrige Results Criteria for Performance Excellence in Education: A Balanced Scorecard Approach

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The authors suggest using a balanced scorecard (BSC) approach to evaluate information technology (IT) resources in higher education institutions. The BSC approach illustrated is based on the performance criteria of the Malcolm Baldrige National Quality Award in Education. This article suggests areas of potential impact of IT on BSC measures in each of the Baldrige Results Categories of the performance criteria. Many of the identified areas of measurement and expected improvement are unique to educational institutions. The multiple-faceted evaluation approach should provide improved assessment of an institution’s IT resources and offer a broadened perspective of IT usage in the academic setting.

Keywords: balanced scorecard, higher education, information technology

Businesses and educational institutions invest significant amounts of money and time in decisions involving information technology (IT). Universities are increasing usage of IT resources to attract, admit, advise, enroll, instruct, support, and assess students. To make an appropriate selection of additional IT investments, an educational institution should specify its objectives and goals and evaluate how well each potential IT resource would assist in achieving these aspirations. Several questions should be answered. What is the relationship of IT investments to the institution’s mission, core values, and objectives to achieve sustainable results in today’s challenging educational environment? What is the relationship of IT investments to the institution’s mission, core values, and objectives to achieve sustainable results in today’s challenging educational environment? Why is IT resource allocation, deployment, and alignment important? What potential areas of measurement and performance will IT impact? Answers to these important questions should assist educational institutions in selecting and integrating IT resources.

Traditional tools (e.g., capital budgeting techniques) do not give appropriate consideration and weight to important benefits of additional IT resources. Entities (including educational organizations) have to look beyond traditional cost/benefit analysis when evaluating IT resources. Many benefits of IT integration are difficult to measure or remain hidden in traditional, functional costing systems. For example, IT integration can improve data accuracy, customer service, decision making, and productivity. Various techniques are available to evaluate IT investments; discussion of several of these techniques follows in the next section.

PUBLISHED IT INVESTMENT EVALUATION METHODS

Measuring the effectiveness of IT has consistently been ranked as one of the top ten issues in major surveys of information systems managers (Ball & Harris, 1982; Brancheau & Wetherbe, 1987; Dickson, Leitheser, Wetherbe, & Nechis, 1984). Other authors have focused on IT and customer satisfaction and IT and productivity (Brynjolfsson & Hitt, 1995; Brynjolfsson & Yang, 1996; Sinan, Brynjolfsson, & Van Alstyne, 2006).

Parker, Benson, and Trainor (1988) reported five basic techniques for evaluating benefits from IT investments: (a) traditional cost/benefit analyses, (b) value linking that estimates business process improvements, (c) value acceleration that evaluates increased speed of delivering information, (d) value restructuring that calculates
productivity increases of employees and the organization, and (e) innovation evaluation that estimates the cutting-edge business practices derived from the IT investment. Ward (1990) presented a portfolio approach to allocating investments in IT, dividing potential IT investments into four categories: Strategic (critical to future), high potential (important to future), key operational (needed for current success), and support (valuable but not critical to current success). He proposed that each category have a different required level of expected return based on the traditional cost/benefit analyses, value linking, and value acceleration measures recommended by Parker et al. Ward believed the higher the risk of failing in a category should demand a higher required level of return in the category.

Sethi and King (1994) provided a methodology for assessing IT investments’ competitive advantage. Violino (1997) reported use of embellished Return on Investment approaches to evaluate IT investment with modern portfolio theory and economic value added.

Tallon, Kraemer, and Gurbaxani (2000) developed a process-oriented model to evaluate IT investment (based on corporate executives’ perceived value of IT investment). The model considered the focus of corporate IT goals and management practices to influence critical value-chain activities. They found that corporate executives perceived a higher payoff of the IT investment (a) the more focused the IT goal and (b) the more the IT goal aligned with the business’ goals. Barclay (2008) presented a six-dimensional approach to evaluating IT that considers the stakeholder, project process, quality, innovation and learning, benefit, and use. Several prior studies have examined the potential for the application of the balanced scorecard (BSC) approach to higher education. Some studies suggested how BSC could be implemented in an education environment (Cullen, Joyce, Hassall, & Broadbent, 2003; Hafner, 1998; Papenhausen & Einstein, 2006; Ruben, 1999; Sutherland, 2000). Other studies have detailed BSC measures to manage and evaluate administrative and academic activities (Beard, 2009; Chen, Yang, & Shiau, 2006; Karathanos & Karathanos, 2005; Umashankar & Dutta, 2007; Umayal & Suganthi, 2010). Chang and Chow (1999) reported accounting department heads were generally supportive of BSC’s applicability and benefits to accounting programs in enhancing strategic planning and continuous improvement efforts. Bremer and White (2000) explained how BSC was used in curriculum design for an accounting program. Kim, Yue, Al-Mubaid, Hall, and Abeysekera (2012) explored the use of the BSC perspectives in assessing information systems and computer information systems programs. Schobel and Scholey (2012) studied the use of the BSC to assess the distance learning environment in higher education, highlighting the importance of focusing on financial strategies.

Al-Zwyalif (2012) pointed to the importance of using BSC in developing countries and queried deans, deputy deans, heads of scientific departments, financial managers and administrative managers in Jordanian Private Universities. He determined that the leaders in these private institutions were aware of BSC and believed that the basic resources to implement BSC were available. Kamhawi (2011), using a Delphi process, determined that IT plays a critical role in the adoption of BSC. However, none of those authors focused on using a BSC approach in evaluating IT.

Before looking at a suggested application of the BSC to evaluating the IT resource, this paper presents a brief discussion of strategic planning and the IT resource in the next section.

STRATEGIC PLANNING PROCESS
AND IT RESOURCES

Educational institutions have increasingly undertaken strategic planning to improve achievement of organizational objectives and operational efficiency. Components of the educational strategic plan (mission, vision, objectives, strategies, goals, and initiatives) should be of high importance and properly communicated to stakeholders-administrators, faculty, employees, students, parents, and future employers. Measuring and reporting performance consistent with the institution’s mission, objectives, goals, and initiatives requires a multifaceted approach. A BSC approach that considers various areas of measurements should be an integral part of the strategic planning and management system.

IT relates to the strategic planning process in a variety of ways. IT can be a valuable communications tool. IT may support the attainment of other objectives and goals by providing efficient and effective means of collecting, processing, and reporting performance data. Competency of students, faculty, and staff in IT may be an explicit institutional aspiration. The availability and utilization of IT resources to enhance the students’ educational experience and expand access to programs could be an explicit institutional aim. IT may assist in developing and marketing the institution’s brand or uniqueness and in cultivating relationships with alumni, employers, and potential benefactors. IT can help demonstrate fiscal responsibility, stewardship of resources, and compliance with laws and regulations. IT can provide a safer campus with warning systems for various campus and community emergencies. Thus, IT represents not only a desired resource, but also a tool used to improve communication, to achieve and evaluate goals, to safeguard other resources, and to provide better services to constituents. The next section will demonstrate a BSC approach in evaluating IT resources in a university setting.
APPLYING A BSC APPROACH TO IT RESOURCES
OF AN EDUCATIONAL ENTITY

To date, no single technique has been effective in demonstrating the wide range of benefits derived from IT. Measuring IT benefits using only financial measures is problematic because some benefits are often hard to quantify in dollars and IT intangible benefits are excluded. Difficulty arises when trying to measure qualitative improvements with quantitative metrics. Here we explore how the criteria for the Malcolm Baldrige National Quality Award (a BSC approach) could be used in considering IT investments in a university.

A BSC should be a component of a strategic management system that links the entity’s mission, core values, and vision for the future with strategies, targets, and initiatives explicitly designed to inform and motivate continuous improvement efforts (Hoffecker, 1994; Kaplan & Norton, 1992, 1993, 1996a, 1996b; Maisel, 1992; Newing, 1994, 1995). Aligning IT resources with the Malcolm Baldrige National Quality Award performance criteria reveals both financial and nonfinancial benefits of IT initiatives and demonstrates how IT is an important consideration in the strategic management system.

Kaplan and Norton (1992) first introduced the BSC concept in the Harvard Business Review article, “The Balanced Scorecard-Measures that Drive Performance.” The basic premise of the BSC is that financial results alone cannot measure and explain value-creating activities (Kaplan & Norton, 2001). Kaplan and Norton (1992) suggested that organizations should develop a comprehensive set of financial and nonfinancial measures of performance. They suggested that measures address the follow four perspectives:

1. financial perspective,
2. customer perspective,
3. internal business processes perspective, and
4. learning and growth perspective.

The measures in these four perspectives must align with the company’s vision and strategic objectives (Kaplan & Norton, 1996a). The identification of goals, measures, and targets consistent with the organization’s vision, mission, and objectives should integrate with strategic planning, implementation, and evaluation.

Building on the BSC approach, the Malcolm Baldrige National Quality Award performance criteria for the education award:

...are designed to help educational institutions use an integrated approach to organizational performance management that results in 1) the delivery of ever-improving value to students and stakeholders, contributing to education quality and organizational stability, 2) improvement of overall organizational effectiveness and capabilities, and 3) organizational and personal learning. (Baldrige National Quality Program, 2009, p. 51)

The 2013–2014 criteria require that applicants for this award specify results in the following outcomes areas (Baldrige National Quality Program, 2013):

1. Student learning and process results (customer perspective and internal business process perspective): Should demonstrate the effectiveness of instruction and curriculum on student learning for all student segments and the students’ satisfaction in learning outcomes. Key learning results and process effectiveness and efficiency results that directly serve students should be considered. Performance measures should include, as examples, the capacity to improve student performance, student development, and the educational climate; indicators of responsiveness to student or stakeholder needs; and key indicators of accomplishment of organizational strategy and action plans that impact on student learning.

2. Customer-focused results (customer perspective): Should involve satisfaction measurements concerning educational programs, service features and delivery, and complaint resolutions that bear on student development and learning. Reported results should measure and analyze long-term relationships and engagement of students and stakeholders.

3. Workforce-focused results (learning and growth perspective): should measure important characteristics of the work environment (productivity, learning-centered, engagement, and care for employees). Measurement parameters should include, for examples, innovation and suggestion rates; retention rates; internal promotion rates; courses or educational programs completed; increase in certification levels of employees; knowledge and skill sharing; employee well-being, absenteeism, and turnover; and number of employee grievances.

4. Leadership and governance results: Should evaluate the organization’s leadership, governance, strategic plan achievement, and social responsibility. Performance measures include achievement of the strategic objectives; internal and external fiscal accountability; indicators of ethical behavior, stakeholder trust in the governance of the organization, regulatory and legal compliance, safe environment, and organizational citizenship.

5. Budgetary, financial, and market results (financial perspective): Should measure the entity’s key budgetary, financial, and market results including an assessment of the effectiveness of financial resources management, long-term financial viability, and market opportunities and risks.
These results areas represent a balanced scorecard for an educational institution. IT has the potential for impacting the above perspectives in both direct and indirect ways. Using the Malcolm Baldrige BSC approach, Table 1 highlights the alignment of IT resource applications in an educational institution to the five outcomes or results criterion.

### HOW IT CAN ENHANCE STUDENT LEARNING AND PROCESS RESULTS?

The student learning and process results criteria are unique to educational institutions. The evaluation of a business or typical government agency would not consider a student learning outcome. Integration of IT can directly and indirectly impact student learning results. Focusing on student competencies in technology is an important component of a university education to prepare students to thrive in today’s IT-dominated world.

Computer-based testing gives students quicker and individualized feedback from the assessments (examinations, homework). Technology (through learning management systems, email, course web pages, and course chat rooms or forums) has allowed connectivity between the student, course instructor, and other students. Computer- and web-based programs allow students to acquire and reinforce topics through instant grading. Instructor and course websites support face-to-face courses by providing access to additional learning materials. In more recent years, online courses have expanded the traditional classroom around the globe and to 24/7 access.

IT enables the university to provide better service to its students by providing services online. Online registration allows quicker and more convenient course enrollment. Computerized verification of students’ records for course prerequisites allows for better assurance that only eligible students enroll in a course. Use of electronic waiting lists for full courses makes it more fairly and efficiently distributes seats to the first on the list. IT resources allow students to get quick answers to questions with self-service query capabilities, such as running a report to determine the courses needed to complete their selected degree.

Quicker identification and better supervision of at-risk students is possible with the aid of IT resources. Electronic monitoring of grades and class attendance through online grade books and online attendance reporting enables more...
immediate detection of students having trouble. Exception reporting of these students could alert proper personnel so immediate intervention can be considered.

IT can improve communication within an educational institution. Electronic communications (e.g., email, instant messaging, texting) improves the efficiency of communication by allowing individuals to generate a message when a question arises, then work on other matters while waiting for a reply. The recipient can retrieve messages when it is convenient, not requiring the meeting of the two or more individuals for telephone conversations or face-to-face meetings. A person or department can disseminate information to many interested parties through a mass communication or posting of information on a password-protected webpage.

HOW IT CAN ENHANCE CUSTOMER-FOCUSED RESULTS?

Analysis of IT impact on customer-focused outcomes is different in an educational institution from the evaluation of a business or typical government agency because of the various customers’ diverse needs. Obviously, the customers of an educational institution and its IT resources include the students. Other customers include future employers of the students, alumni, students’ parents, faculty, staff, and community.

Course scheduling using IT can provide many benefits. Possible benefits include elimination of scheduling conflicts in terms of time, place, and personnel. Monitoring of course demand allows modification of course offering based on actual demand. Use of current enrollment data could assist in forecasting future courses needed.

Not only can advisors and advisees stay connected by electronic communications and websites, IT resources also allow quick access to online transcripts and degree requirement reports. Instant generation of what-if analyses assist during advising sessions if students are considering different majors/minors.

HOW IT CAN ENHANCE WORKFORCE-FOCUSED RESULTS?

The first two areas of results (student learning and process results, customer-focused results) in the performance criteria for the education award evaluate functionality unique to educational institutions. Educational institutions will use IT in unique ways to achieve the student learning and customer-focus outcomes. In the remaining results areas, educational institutions may use IT in manners similar to businesses and governmental organizations.

IT resources provide tools for collaboration at increased communication speeds. This empowers faculty members to share and receive ideas on improved teaching effectiveness, undertake research and professional development, and network with colleagues and other professionals.

Technology allows increased professional development opportunities for staff and faculty. IT resources allow training of faculty and staff by using online courses, webcasts, and interactive television that can involve quicker delivery of new information that traditional methods of training and professional development (written instruction manuals and face-to-face sessions). The human resource function has also been transformed by IT. Many employee forms or data entry screens are available online to allow employees to self-service changes in tax and benefits information. Having payroll information digitally sent to financial institutions and check stubs available online has significantly reduced paper and distribution costs.

IT can also provide improved efficiency and communication in facilities management repairs and maintenance. Personnel can complete an online work order request and receive electronic notifications when a work request is accepted, scheduled, and completed, or why the work request was denied.

RELATED TO LEADERSHIP AND GOVERNANCE RESULTS

Effective and efficient use of IT resources can improve strategic management of the institution. Improved two-way communication and participation with constituents can result from IT usage and should improve the development and distribution of the university’s mission, strategic vision, core values, and priorities. Faculty, staff, administrators and other stakeholders should play an active role in the development of the mission and vision statements and in the priorities of the university. IT can provide efficient ways to solicit input and feedback.

IT resources can enhance communications of matters other than just strategic planning. Electronic communication is often faster, easier, and cheaper than traditional mail, memo distribution, or people assembly. Selective distribution of electronic communication can reduce information overload from frivolous data. IT resources can improve the internal control system. Transactions should require proper authorization (controlled by user identification and password of individuals creating or approving the transaction). Electronic controls can prevent improperly authorized transactions. Programming of the system could highlight particularly large transactions, actions undertaken by someone other than the employee with assigned responsibility, actions taken from an address other than the typical or a local address, or cases where management electronically overrode the programmed controls. Controls need to be in place to assure that the educational entity complies with laws, regulations, and students’ privacy rights. IT resources can monitor, perform, and enforce these controls.
IT resources can also enable an institution to provide individualized services to students with special needs (disability services). IT resources can be used to convert printed materials to larger print or audio for students with visual impairment. Computerized testing could replace pencil-and-paper examinations for students with movement difficulties.

Institutions must identify, quantify, and implement various measures to evaluate performance and promote continuous improvement throughout the university. IT can explicitly and implicitly be part of those objectives or part of measuring and evaluating performance.

RELATED TO BUDGETARY, FINANCIAL, AND MARKET ISSUES

Web-based resources are important tools used to attract students to an institution of higher learning. Data obtained from university web pages may be the first exposure that a prospective student has to the institution. An attractive, informative, and easy-to-navigate set of webpages is essential in marketing to potential students and may influence their selection of institution. The information provided could enhance each student’s decision-making process with key facts such as tuition cost, student graduation rate, and student retention comparisons between the institution and rivals.

Over the years, IT resources have continued to grow in usage by many entities. The most obvious reasons for IT explosion in organizations are its abilities to reduce cost and make data more easily and quickly accessible to a wide group of users. Cost savings come over time and usually result from reduction of human labor to complete a task. Having one data set from which all users can draw will improve data accuracy, reduce duplication of effort, reduce total amount of data stored, and eventually reduce cost.

CONCLUSIONS

This article proposes aligning IT resources of an educational institution with the BSC-type results criteria of the Malcolm Baldrige National Quality Award in Education. Educational institutions are different from businesses and typical governmental agencies so their IT resources need a unique evaluation tool. However, other entities should consider the importance of IT resources to reaching goals, improving results, and enhancing long-term sustainability.

This proposal emphasizes the reliance of educational institution on their IT resources in aligning plans, processes, decisions, people, actions, and results. Recognizing the multiple impacts of IT acquisition, implementation, and assessment on educational institutions is essential. IT acquisition requires more than a traditional capital budgeting analysis.

Higher education institutions demand that the IT system increasingly delivers a portion of the institution’s primary objectives of promoting and demonstrating student learning and stakeholder satisfaction. The most significant contribution of this article is the linking of IT resources used in an educational institutional to the specific criteria outcome areas of the Malcolm Baldrige National Quality Award in Education. Action to identify measures and targets in each of the results categories should be undertaken by specific institutions with their mission, values, and strategies in mind.

REFERENCES


