

Charting Our Course: Strategic Planning Approaches in Engineering and Technology

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Abstract

Changes in technology, advances in the professions, complexities in the external environment, and the need to continuously improve all require institutions of higher education to plan for the future. Strategic plans help provide direction and meaning to everyday activities within an organization. It is guided by the vision, mission, values, goals, and the relationships the organization has with key stakeholder groups.

Strategic plans serve as a framework against which physical, fiscal, and human resources are allocated; courses, programs, and curricula are changed and/or created; decision-making occurs; organizational structures are changed; staffing decisions are made; faculty and staff development opportunities are provided; student recruitment, retention, and support activities are aligned; and program-, department-, and school-level objectives are developed.

This paper discusses the importance of strategic planning in engineering and technology education, and describes the process used by one institution to chart its future. How strategic planning was undertaken, including involvement of relevant academic, professional, and industry stakeholder groups, is described. Ways to link strategic planning to continuous assessment, evaluation, and improvement are identified, and practical advice for initiating, reviewing, and implementing strategic plans is presented.

Importance of Strategic Planning in Engineering and Technology Education

Higher education, as a whole, is increasingly being asked to do more with less. State legislatures, policymakers, accrediting agencies, parents, employers, and even students themselves all expect postsecondary education institutions to deliver courses, programs, and services that add value to the economy, create and transmit knowledge, ensure employability, and provide a foundation for lifelong learning, among many other things. Professional schools, such as engineering and technology, must also adapt to a rapidly changing marketplace, defined

by the unique, and sometimes contradictory, needs of business, industry, and governmental organizations.^{1, 2, 3 and 4}

Faculty in engineering and technology face the daunting tasks of balancing teaching, research, and service activities, all while attempting to maintain currency in their respective technical specialty. Administrators in such environments face the challenging tasks of developing school, departmental, and program priorities, while seeking to align the activities of the specific academic unit to those of the broader campus.⁵

Process Used for Strategic Planning

Indiana University-Purdue University Indianapolis (IUPUI) is a large, urban institution serving 30,000 students, 1,900 full-time faculty, and operating with tremendous programmatic diversity. The twenty-plus academic units range from the traditional humanities, arts, and sciences to several professional schools (e.g. Engineering; Education; Business). Students are often first-generation college attendees; possess varying levels of academic preparedness; are largely commuter in nature; hold many adult social roles concurrent to their enrollment in postsecondary education; and persist to degree completion well beyond the typical 4- to 6-year timeframe that is common at most largely residential institutions serving a more exclusively traditionally aged student population.

This student and programmatic diversity is further complicated by IUPUI's largely decentralized decision-making and budgeting approach. For example, the financial management system requires each academic unit to realize its own revenue streams (through tuition, state appropriations, indirect cost recovery from grants and contracts, and development/fundraising efforts); pay its direct costs (e.g. salaries); and pay for shared central services (e.g. Library resources) through a University-mandated tax.

Against this backdrop of diversity, decentralization, and dynamic external marketplace conditions, the Purdue School of Engineering and Technology at IUPUI recently undertook its triennial strategic planning process. Because of the complexities of operating within the IUPUI organizational environment, coupled with advances in the engineering and technology professions, an updating of the strategic plan at regular intervals is required. In the Purdue School of Engineering and Technology, the practice has been to revisit the strategic plan on a three-year basis, in order to provide a long enough time horizon for necessary changes to be implemented, yet short enough to account for changing and/or emerging expectations from our varied constituent groups.

The process used for strategic planning in the Purdue School of Engineering and Technology at IUPUI centered on six steps: (1) understanding the institutional context for planning; (2) conducting a situational analysis; (3) developing specific goals and objectives; (4) identifying internal champions; (5) prioritizing objectives and allocating resources; and (6) implementing the plan.^{6 and 7}

Understanding the Institutional Context for Planning

The first step in effective strategic planning understands the context in which planning – and, ultimately, action – takes place. Identifying, understanding, and embracing the vision, mission, values, and goals of the institution serve as important foundations to strategic planning. The vision of IUPUI is to be one of the best urban universities, recognized locally, nationally, and internationally for its achievements. The mission of IUPUI is to provide for its constituents excellence in teaching and learning; research, scholarship, and creative activity; and civic engagement. Both the vision and mission are underscored and characterized by the values of collaboration within and across disciplines and with the community; a commitment to diversity; and the pursuit of best practices. Because the Purdue School of Engineering and Technology operates within the broader IUPUI organizational environment, it was necessary to align the school's efforts to the broader strategic directions of the campus. As such, the strategic plan is both derived from and aligned with the mission and goals of the IUPUI campus.

Conducting a Situational Analysis

After understanding the institutional context for planning, the next step in the process involved a situational analysis. A situational analysis involves stakeholders “taking stock” of the environment for the purposes of identifying internal strengths and weaknesses and external opportunities and threats. For our purposes, stakeholders included faculty, administrators, staff, students, alumni, and advisory boards comprised of business and industry representatives from each of the respective departments and programs in the School. A review of past initiatives, current progress, and changing marketplace conditions (e.g. demand for graduates of particular programs; diminished state appropriations; academic preparedness of students), facilitated by a faculty member with experience in strategic planning, resulted in a portrait of the current and future issues, challenges, and opportunities confronting the School. By involving all relevant stakeholder groups in the situational analysis, each group's perspective was considered, and inherent “buy in” to the planning process was achieved.

Developing Specific Goals and Objectives

Representatives from each stakeholder group – faculty, administrators, staff, students, alumni, and advisory board members – were involved in the development of specific goals and objectives for the three areas of mission emphasis: teaching and learning; research, scholarship, and creative activity; and civic engagement. The goals adopted at the School level were consistent with those of the Campus, thus providing alignment, as noted below:

Excellence in Teaching and Learning

1. Attract and support a better prepared and a more diverse student population
2. Support and enhance effective teaching
3. Enhance undergraduate student learning and success
4. Provide effective professional and graduate programs and support for graduate students and post-doctoral fellows

Excellence in Research, Scholarship, and Creative Activity

1. Conduct world-class research, scholarship, and creative activity relevant to
2. Indianapolis, the state, and beyond
3. Provide support to increase scholarly activity and external funding
4. Enhance infrastructure for scholarly activity

Excellence in Civic Engagement

1. Enhance capacity for civic engagement
2. Enhance civic activities, partnerships, and patient and client services
3. Intensify commitment and accountability to Indianapolis, Central Indiana, and the state

The institutional context for planning and the situational analysis both provided the necessary organizing framework for developing School-specific objectives. This afforded the School the opportunity to align its efforts to the activities and initiatives of the Campus, while also developing objectives that recognized and accommodated the uniqueness of programs offered at the School-level. Therefore, the School developed nearly 70 total objectives that tie to the above goals. While 70 objectives seems excessive, it is important to note that, in many cases, the objectives that were developed sought to advance existing work already in progress.

Identifying Internal Champions

No strategic plan can succeed unless there are those who champion the specific objectives that have been developed. Instead of assigning responsibility to a group or a department, our School opted to identify an administrator who would serve as “champion” of each objective. The champions’ responsibilities included ensuring that objectives would be implemented, and that appropriate internal and external stakeholders would contribute to accomplishing or advancing the particular objective.

Prioritizing Objectives and Allocating Resources

Given that the strategic plan was developed for implementation over a three-year period, it was necessary to prioritize each objective as to its relevance and immediacy of action. Also important was the resource allocations necessary to accomplish the objective. To determine the priorities and resource allocations for strategic planning objectives, a group comprised of internal champions met to render a decision on priorities and allocations. Since many objectives were, in essence, part of an existing job or activity, no resource allocation decisions were needed; in other instances, modest reallocation of resources was necessary to implement a new objective. Involving a peer-review process to determine priorities and resources resulted in a collaborative decision-making approach that yielded buy-in and understanding from the internal champions and the Dean.

Implementing the Plan

Strategic planning processes are often criticized because of the inherent cost (time, energy, effort, and money) in developing lofty goals and objectives often yields little return-on-investment due to poor implementation and follow-through on the part of individuals for whom

the plan was developed. Thus, ensuring proper – and continuous – implementation and monitoring of strategic planning goals and objectives is important. In our case, we sought to imbed the accomplishment of goals and objectives into individual, departmental, and/or program responsibilities. This was accomplished by regularly communicating the strategic plan – including its importance, its linkage to broader School and Campus initiatives, and its progress. One way that communication and implementation were facilitated was through the use of a web-based reporting tool that permitted champions to (a) catalog activities related to specific objectives as they occurred; (b) dialogue with stakeholders on objective-related activities; (c) review postings made to the reporting tool; (d) develop reports on progress; and (e) provide progress to internal and external groups on the School’s effectiveness in implementing the plan.

Linking Strategic Planning to Assessment, Evaluation, and Improvement

While strategic planning is necessary in higher education, it is also viewed by many as burdensome and, unfortunately, as a process that produces little lasting impact. Thus, in order for strategic planning processes to achieve optimal effectiveness, the plan should be linked to existing assessment, evaluation, and improvement initiatives. This assures that strategic planning is convergent with past and present work, and that its utility is maximized. As such, there are three main imperatives of strategic planning.

First, strategic planning should serve to unite disparate aspects of administrative and faculty work to the broader aims and purposes of the School and Campus. Second, strategic planning should be linked to the demands of regional accrediting agency requirements; School- and program-specific accreditation requirements; and the needs of the business and industry constituency. Finally, strategic planning should inform resource allocation decisions and improvement efforts at the program-, department- and School-levels.

Practical Issues in Initiating, Reviewing, and Implementing Strategic Plans

Our experience with strategic planning has yielded the following insights that are vital to success in developing, implementing, and, ultimately, evaluating goals and objectives in the plan:

- Identify the need for and purposes of strategic planning
- Allocate sufficient resources (people, time, and, on occasion, money) to strategic planning.
- Involve representative stakeholder groups in contributing to the strategic plan.
- Consolidate, prioritize, and scrutinize goals and objectives to achieve clarity and balance.
- Identify the champions who are necessarily responsible for ensuring that specific goals and objectives are implemented and evaluated.

- Make the implementation of the strategic plan a part of everyone's job.
- Develop reporting and review mechanisms to regularly assess the progress on the strategic plan's implementation.

Conclusion

While it has been said that life happens while we are busy making plans, this nonetheless does not excuse lack of planning in dynamic, complex organizational environments that frequently characterize most institutions of higher education. Strategic planning can be a valuable tool to facilitate improved decision-making, involve of relevant stakeholder groups, and make appropriate resource allocation determinations. The rapid changes in engineering and technology, coupled with diminished resources and expanding expectations, requires that administrators and faculty work together to chart an efficient, effective future for their School. While there are many variables that ultimately contribute to success, one of the most important foundations is a sound plan.

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