

Transformation of Higher Education Institutional Structure and Operations into a Lean Systems Framework

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Joachim Knuf, DPhil, *Principal*
Organizational Learning Systems, Inc.
joachim.knuf@leansystemsdesign.com
+1 (859) 559-5345

BACKGROUND

“Society has problems;
universities have departments.”
(Sir Douglas Hague)

I

The US higher education system expanded rapidly after WW2, enabled by, among others:

- the *Servicemen's Readjustment Act* (1944; better known as the *G.I. Bill*);
- massive growth of statewide institutions (such as the California Master Plan of 1960 or the creation of the over sixty campuses of the State University of New York (SUNY));
- unprecedented federal support of research and education partly motivated by the Cold War (Federal Grant Universities; Kerr, 1963), focusing on large-scale scientific and technological projects;
- the advent on campus of the baby-boomer generation coinciding with funding opportunities through the 1972 *Basic Educational Opportunity Grant (Pell Grant)*;
- the opening of institutions to minorities, accompanied by a national testing infrastructure;
- a dramatic increase in life-long learning opportunities for post-secondary education graduates compared to high school graduates, following the 1980 recession; and
- a huge investment in brick and mortar, peaking in the 1990s.

In aggregate, these developments, combined with others, necessitated a managerial revolution to maintain control and coordination of highly diverse university and college activities, ranging from sports to research, spawning a commensurate academic bureaucracy mimicking modern corporations and public administrations in functional diversification and complexity.

Much as under the Fordist and Taylorian models of mass production, institutional control migrated from academics practicing at the educational (service) interface, the classroom or laboratory, to a professional hierarchy of managers (sometimes co-opting former faculty) trying to oversee and guide increasingly complex workflows. Hoping for better management results through decomposition, these were sorted functionally into colleges, departments, general services and administration, laboratories, outreach and special programs, multilevel degree tracks, fund raising, extracurricular activities and numerous other divisions, programs and entities, all endowed with budgets, buildings and staffs. In the process, the academic service structure itself, certainly down to the level of dean but typically including department chairs or heads, was retasked with far-

reaching decision-making and other managerial duties, especially relating to the acquisition and control of capital and human assets, creating an increasingly dichotomous internal boundary with faculty, notably in those not infrequent cases where peer-elected representatives such as chairs and deans perpetuated their initial appointments into sinecures of significant control span and tenure.

In structural evidence of this, budget officers, grant administrators, lab managers, fund raising specialists and various other kinds of technical support personnel have proliferated even at the level of mid-size departments, more often than not nested in and replicating parallel developments at the college and university level. Central administrations increasingly regard the President as their main fund raiser and government (or public) relations specialist, adopting for day-to-day management a conventional vice-presidential divisional structure in which important former tasks of the President have been delegated to a reporting level, often to a Provost as Chief Academic Officer, who now sits in a senior leadership cabinet composed of various corporate peers, such as finance, human resources, economic development, athletics, and legal officers and controllers, with the addition of the occasional champion for special causes, such as institutional diversity or commercialization.

While this was occurring, steadily decreasing public financial support and low institutional valuation of classroom teaching at research institutions created an ever more combative environment for tenured and especially untenured faculty competing for scarce research funding, thus turning their attention away from core educational tasks to the acquisition of external revenues and thereby securing promotion and tenure. That also left those core tasks in the hands of a proliferating cohort of teaching assistants and temporary instructors hired on noncommittal annual contracts at 'market rates' and typically with minimal or no benefits, thus allowing student growth (an important metric in the internal competition among colleges over university resources) despite stagnant budgets and historical FTE allocations seemingly affected only by faculty mortality. At the beginning of the 21st century, the academy resembles most other large enterprises in that institutional concerns with its own survival significantly detract from its original mission of value: in this case, human emancipation through education and improvement of society.

Under the current economic conditions, these developments have led to a paradoxical stalemate: Administration and faculty both want to reform the university and increase accountability and institutional effectiveness, yet both perceive the other as conservative and opposed to change, clinging to entitlements. The ensuing battles, erroneously targeted at the concepts of tenure and academic freedom, consume scarce resources and threaten the viability of the institution and the goodwill of its members. These targets are erroneous, as tenure and academic freedom do not stand in the way of progress. Yet administration hopes to gain flexibility by the removal of tenure, when that would only endanger commitment and continuity, while faculty fears micro-managerial incursions into academic freedom that administration neither intends nor is

equipped to undertake due to a ubiquitous Management-By-Objective perspective that cares primarily about input-output ratios of enterprise assets, not about what happens in actual classrooms and laboratories. In fact, the professionalization of management has probably created new degrees of academic freedom, albeit within an increasingly demanding framework of economic and reputational deliverables. *What should be at issue, instead, is a proper institutional process definition that focuses the attention of all parties, and leverages all available resources, to the public delivery of peerless educational value through teaching, research and service.*

II

Lean organizations derive their competitiveness from four related sources. All organizations can be described as having to balance internal and external concerns, and the need for stability with the need for change (*Fig. 1*). Externally, they have to flexibly create a superior value proposition to customers, secure and manage capable workforces and networks of partners and suppliers, satisfy regulatory requirements, and act in environmentally and socially responsible ways. Under the control aspect, they also have to create reliable ways in which value propositions can be translated into products and services, aligning proper structures of governance that ensure organizational effectiveness and accountability. Internally these efforts manifest themselves in a work organization that couples all activities as tightly as possible while providing for sufficient looseness so that local events and breakdowns do not affect the total system. Through the respect and developmental attention organizations pay their members, their discretionary contributions in the form of ideas and learning can then be brought to bear on the totality of organizational activities, resulting in significant improvements in all aspects of next-cycle performance.

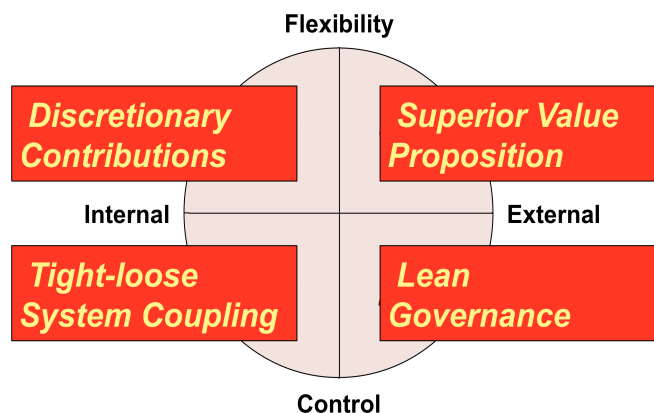


Fig. 1: Lean System Competitiveness Model

In higher education, superior value propositions normally take the shape of teaching, research and service offerings. They constitute a subjective perception on the part of a client of what they want and believe they can get out of (using) a product or service, keeping in mind perceived trade-offs between benefits gained and costs incurred. Most institutions exist in a multiple-constituent environment, having to address the expectations of students, parents and supporters, employers, communities, governmental entities, alumni, and numerous others of various degrees of saliency. A clear definition of educational value streams identifying dedicated institutional resources is a first important step in understanding the conditions of providing such value. Conformance to traditional educational ideals under the guidance of faculty no longer can be considered a valid value proposition.

Applying lean governance principles to higher education requires a mapping and review of all institutional decision processes. Of importance is not so much the respective seat of authority: administration, faculty or other, but the creation of a governance model that supports and monitors institutional workflows at the lowest, most direct level, guided by principles and policies that standardize such effort and focus managerial attention only on exceptional situations.

System coupling ensures that all institutional processes interface smoothly and effectively, minimizing duplication of effort and other losses. For example, student advising within a framework of common tracks with defined options ensures that the proper sequence of courses is taken without sacrificing individual needs. Such a form of standardization can then benefit, among others, more reliable planning of faculty and staff effort as well as physical plant utilization, thus reducing capital costs. A structure of cumulative internships, classroom speakers, student projects, and so on can also couple individual education to subsequent employment, boosting placement rates, which then creates higher perceived value amongst potential clients choosing between offerings by different institutions.

Discretionary contributions to the continuous improvement of all institutional processes and efforts are the most underdeveloped aspect of higher education. Some colleges may have suggestion schemes on their books but their impact appears to be negligible. As teaching institutions, they tend to be rather blind to their own learning opportunities as they already master high levels of expertise.

In conclusion, the lean system framework is applicable to higher education. It highlights four important aspects increasing institutional competitiveness and benefits all constituencies through improved services, reduced cost, faster processes and higher quality.

The higher education community today faces a number of systemic challenges that must be addressed in a transformation of its structure and operations into a lean systems framework. Some of these challenges are primarily external and relate to the role and relevance of educational institutions in society, thus requiring longer-term collaborative approaches to a review of missions and programs; others are internal and could be addressed rather expeditiously, given a will to act on structures and processes.

Missions and programs

Globally, demand for access to higher education far outstrips availability. In order to reach out to those constituencies and be able to do so in a manner affordable to clients, campuses have to open up through technology-based distance-learning offerings that can disseminate learning efficiently while also maintaining its effectiveness. This will require blended learning approaches enhanced by an off-campus system of satellites offering face-to-face interactions and social support through the creation of cohorts and peer groups. Technology is also crucial in building a capacity to offer programs round the clock and thereby maximize the return on capital and technology investments.

To maintain their relevance and avoid becoming mere knowledge transfer and training organizations, higher education institutions must at the same time promote research within and across disciplines and integrate those efforts with translational teaching and service missions to promote original knowledge generation—very much the Humboldtian tradition. But increasingly, research will be conducted in clusters involving other institutions and the private and public sectors; teaching will engage school systems and industrial and professional continuous education functions to prepare the workforce of the knowledge economy in a life-long learning model; and service will launch the collective intelligence of the institutions against the most challenging problems of society. Institutional accessibility to a wide range of external constituencies and proactive definition and management of the associated interfaces assume crucial importance.

Ease of student access to institutional services is essential. From the initial contact on, streamlined interaction with a minimum of human and virtual agents who are capable of providing broad orientation on administrative as well as educational issues increases perceived value. Educational offerings should be configurable to correspond to student need and offer choices and alternatives rather than restrictions. Every petition is a change request generating waste and should be unnecessary. Rather than target fourth-year graduation statistics, credit accumulation within and outside the institution should be flexible, permeable and, if necessary, discontinuous (probably within a contractual framework determining duration, content and qualification modality for a course of study, thereby also satisfying accreditation requirements) to allow for part-time work and other eventualities, especially in the case of adult or returning students.

Pedagogy will have to come up with answers to ensure quality, indicating an increased role for information technology as well as social networking approaches, such as student cohorting.

To this day, universities are designing their programs with a view to standardization and student flow. Curriculum reviews attempt precarious balances between traditional notions of academic freedom, instructional message conformity, unified assessment across course sections, and proper cumulative sequencing of courses to facilitate well-defined and quick major careers for undergraduates, with progressively more relaxed constraints for graduate students. This speaks to a strong product orientation, in which the institution offers a set of educational packages to a marketplace that is increasingly defined by customer needs at odds with such packages. Memorization and recall of course contents are not strong indicators of professional success in the knowledge economy. Complaints from employers about the lack of communication skills, second-language proficiency, creative problem-solving, or teaming ability of graduates are common, especially in programs leading to professional careers, and signal a needed revision of general studies ideologies that, for example, routinely require future social workers to obtain credits in hard sciences before entering their major. In transforming higher education, the voice of the customer must become more audible. This also entails stronger support of life-long learning opportunities, on campus, *in situ* or virtual, such as mobile learning (mLearning). Ultimately all degree programs must instill not only strong life-long learning values but also equip graduates with advanced critical-thinking, self-learning and continuous improvement skills if they want to stay relevant in the context of their variously evolving careers.

Structures and processes

With minor concessions, university structures today faithfully replicate the medieval collegial organization into faculties common since at least 1088, the birth year of the University of Bologna (also the home of academic freedom, granted by Frederick I Barbarossa's *Constitutio Habita*, securing independence from state and church). In a sense, these structures are feudal in nature and still consist of ranked hierarchies of officials with requisite control over institutional resources and highly ritualistic procedures, both for decision-making and for internal ascent. Finely segmented academic divisions and functions exist *sui generis* and correspond at best awkwardly to societal needs that tend to be ill-defined, complex, comprehensive, and emergent. Amazingly, the ivory tower prevails for now—but only until it meets real opposition, especially from virtual and corporate universities competing on access, cost and quality, in other words, customer value. Perhaps laboratory-based courses will be the last ones to fade, but in a world where new automobiles can be designed, engineered and completely performance-tested in computer simulations, the future of the physical laboratory is probably doubtful.

Any transformation of institutional structures and processes must be conducted in a multilateral dialogue between those who best understand the challenges of developing knowledge domains (faculty) and those who represent the various actually existing problems in society, with administrations in the institutional and the private and public sectors embracing a strong supportive and evaluative role. Initial impetus (pull) for an institutional response should normally come from the respective problem, the mitigation or solution of which constitutes the core value proposition. Institutional, private and public resources must then be aligned in a—perhaps from case to case unique—problem-specific configuration and leverage research, teaching and service at that problem, with larger problems likely to require interinstitutional and extramural configurations. Designing a traffic-control system for a large city; developing technology to store wind power; educating multidisciplinary engineers for collaboration with medical researchers in bioengineering assignments; or retraining the industrial workforce in lean systems thus become the kinds of value streams which the higher education system must service. The need should then be clear for considering increased internal mobility of faculty and students; faculty-staff-student project partnerships; interdisciplinary hiring and assignments (subject to contract-based rather than traditional departmental control of tenure and promotion); problem-driven and temporary consortia on and off campus; continuous cross-disciplinary networking and linking to discover new value streams or to align to existing problems; resource decentralization; intrapreneurial angel and start-up funds with risk-reward components; recognition of new, non-cumulative research designs; and other fundamental changes to be discovered in a comprehensive value-stream review that respects the specific situation of the institution in its environment.

And most of all, such effort must be real, strategically aligned and measurable by its results—not yet another vapidly obscuring business as usual.

Bibliography

Hague, Douglas (1991). *Beyond universities: A new republic of the intellect*. London: Institute of Economic Affairs.

Hanna, Donald E. (2003). Building a leadership vision. Eleven strategic challenges for higher education. *Educause Review*, 38: 4, 25-34.

Kerr, Clark (1963). *The uses of the university*. Cambridge, MA: Harvard University Press.

Knuf, Joachim (1992). 'Ritual' in organizational culture theory. Some theoretical reflections, and a plea for greater terminological rigor. In S. Deetz (Ed.), *Communication yearbook* (vol. 16, pp. 61-103). Beverly Hills: Sage Publications.

Knuf, Joachim (1995). Changing organizational cultures in the lean manufacturing environment. In Kozo Saito (Ed.), *Principles of continuous learning systems* (vol. 1, pp. 57-82). New York: McGraw-Hill.

Knuf, Joachim (1996). Transformational learning and change: From the practice of lean manufacturing to the culture of continuous improvement. In Kozo Saito (Ed.), *Principles of continuous learning systems* (vol. 2, pp. 55-88). New York: McGraw-Hill.

Knuf, Joachim (2000). Benchmarking the lean enterprise: Organizational learning at work. *Journal of Management in Engineering*, 16: 4, 59-71.

Knuf, Joachim & Lauer, Mark (2006). Normal excellence: Lean human performance technology and the Toyota Production System. In J. A. Pershing (ed.), *Handbook of human performance technology: Principles, practices, potential* (717-742). San Francisco, CA: John Wiley & Sons, Inc.

The author:

Dr. Knuf was one of the original architects of the model lean systems research and education program created at the invitation, and with financial and mentoring support, of Toyota Motor Manufacturing between 1994 and 2006 at the University of Kentucky, where he taught for two decades as a faculty member in the Department of Communication and the Center for Manufacturing. He and his students have conducted research at Toyota and other leading companies on the lean transformation journey, especially in the area of human factors and organizational culture. During his tenure, Dr. Knuf received several university teaching awards, represented his college in the university senate, was appointed to committees at all levels, including program review and accreditation committees, and served his college as Associate Dean for Graduate Studies. He shares his findings with businesses, institutions and professional organizations around the world.