The Knowledge Product Lifecycle and the Strategic Dashboard

Linda L. Glessner
Denise Gillis

UNIVERSITY OF TEXAS-AUSTIN

> *Our institutions must remain places of learning where human potential is transformed and shaped; the wisdom of our culture is passed from one generation to the next; and the new knowledge that creates our future is produced.*
>
> —James Duderstadt

INTRODUCTION

Several years ago, the Continuing and Innovative Education (CIE) leadership team at UT-Austin took a hard look at the unit through the lens of customers to reevaluate our programs and services and the role we played in serving the lifelong educational needs of our constituents. Our goal was to provide continuous learning for a productive, globally competitive workforce within a dynamic educational context. We addressed issues such as markets for post-baccalaureate education, competition and collaboration among higher-education providers, educational technologies, knowledge management, quality assurance, accreditation, and university leadership. During this exploration process, two concepts emerged from the literature reviews and leadership dialogues: the Blue Ocean Strategy (BOS), which looks at the market space and competition, and Product Lifecycle Management (PLM), which looks at product lifecycle development in an organization. These two concepts became guideposts

for identifying performance drivers and integration strategies that create resilient and sustainable enterprises within the CIE division. Further, they helped the organization to redefine the value-add role of CIE as a division of the parent university. This article describes our efforts to define a new paradigm for continuing education.

BLUE OCEAN STRATEGY (BOS)

As defined by Chan and Mauborgne (2005), a BOS is about maximizing opportunity in market space and minimizing risks. When utilized in conjunction with a viable business model, it enables leadership to mobilize an organization to overcome the fear of taking risks in an organization by using six basic principles:

- Reconstruct market boundaries
- Focus on the big picture, not the numbers
- Reach beyond existing demand
- Get the strategic sequence right
- Overcome key organizational hurdles
- Build execution into a sustainable strategy

Once developed, a BOS can become the tool for conducting diagnostics and evaluations of programs in an organization's portfolio with minimal risk. We adapted the elements of the BOS strategic canvas normally used by private industry to one that would encompass cost-recovery settings. The exercise culminated in four organizational drivers and twelve assessment indicators (Table 1).

Client/Market	Financials
• Market Viability • Growth • Product Life Cycle	• Profitability • Margins • Funding Portfolio
Operational Dexterity	People/Resources
• Product Quality • Resource Management • Critical Thinking/Decision Making	• Staff Development • Skill Gap Analysis • Career Paths

Table 1: CIE Blue Ocean Strategy Market Drivers

As the enterprise leaders and executive leadership identified the elements of the BOS and incorporated them, it became evident that other compelling questions needed answering before the enterprises could fully realize the strengths of their operations. For example: What are the primary goals for organizational improvement across each of the four drivers and twelve indicators? Should the drivers and indicators be prioritized from most important to least important or weighted in terms of value? What are some of the hindrances and/or enablers for carrying out the results of the analysis? What is the timeline for implementation?

The leadership in CIE sought out the assistance of a campus assessment team to design a tracking spreadsheet that could provide concrete answers. The result was a BOS Organizational Assessment Matrix (Table 2), which enabled enterprise leaders to give operational meaning to the four drivers and twelve indicators and provide a communication vehicle to individual markets.

Goal	What are the primary organizational areas to improve?
Objectives	What do you plan to achieve?
Tactics (1 - 5 years)	What steps do you need to take to achieve your objective?
Measures	What data will help you measure progress (stated in terms of number, percentage, amount, etc.)?
Level of competence / Targets	What are your specific numerical benchmarks that tell you if your strategy has succeeded?
Resources	What resources (funding, staff, skills, hardware, software, facilities, etc.) will be required?
Timeline	When will the strategy be implemented and related data collected?
Results	What are your findings?
Actions	What changes need to be made based on the data?

Table 2: Blue Ocean Strategy Organizational Assessment Matrix

PRODUCT LIFECYCLE MANAGEMENT (PLM)

Toward the end of the second year of the BOS analysis, customers were expressing their concern that our training programs and services were outdated and in need of some customization. It became even more critical to act given the looming media outcry over higher education's role in areas of accountability, accessibility, and affordability for learners at large and competition from a host of private, for-profit education providers. CIE's management engaged in discussions with enterprise leaders about a Product Lifecycle Management (PLM) framework for a more in-depth look at enterprise products and services (Table 3).

The Product Lifecycle Management (PLM) framework identifies stages that any product or service goes through during its lifetime. Each stage consists of distinct characteristics, which, if understood, anticipated and effectively managed, can ensure that a business remains successful by realizing the optimum mix of revenues to expenses that affect the bottom line, and by ensuring a healthy mix of product lines dispersed across a product lifecycle continuum.

The PLM framework consists of five distinct stages, each with identifiable characteristics:

Development: This is the inception stage of any product where planning is conducted, viability of the product line assessed, and, if it is determined that the product would be a useful asset, it is built, acquired, and prepared for launch.

1. Market Introduction: The product is launched and introduced to the market.
2. Growth: The product is well established in the market and competitor differentiators become critical.
3. Maturity: The product ages, sales peak, and then begin to decline.
4. Retirement: The product has outlived its usefulness and the decision to repurpose or retire needs to be addressed.

	Stage 1 Development	Stage 2 Market Intro	Stage 3 Growth	Stage 4 Maturity	Stage 5 Retirement
Costs	Very high	High	Reduced	Very low	Counter-optimal
Sales volume	None	Low	Significant increase	Peaks	Decline or stabilize
Market-ing	None or pre-market	High (critical)	Maintenance (medium)	Maintenance (low)	Declines or stops
Competi-tion	Little or none (watching and evaluating growth and acceptance)	Little or none (watching and evaluating growth and acceptance)	Increases	Stiff	Maintains or declines
Profit/ Loss	Loss	Loss	Profitable	Profitable but waning	Diminished or increasingly unprofitable (ops/maintenance/distribution levels must be diminished)
Demand	N/A	Must be cre-ated	Public aware-ness	Losing inter-est	Maintenance only
Pricing	N/A	Introductory and experi-mental	Price to maxi-mize market share	Declines to compete (brand dif-ferentiation critical)	Must increase to maximize profit-ability until end-of-life
Custom-ers	None	Must prompt them to buy	Buy without prompting	Maintain old; few new	Losing existing; no new
Develop-ment	New	New development, little maintenance	Maintenance and enhancements	Maintenance and enhancements	Maintenance

Table 3: Product Lifecycle Management Framework and Stages

PHASE I: LAUNCHING THE PLM

Using the findings from the BOS analysis, we undertook a PLM case study across the division. Phase I of the case study occurred over three months. To begin the process, each enterprise leader within the division was inter-viewed for a minimum of two hours over a three-day period. Each product and/or service was ranked by perceived importance to the portfolio. We asked enterprise leaders to address the following topics to determine ap-propriate ranking:

- Rationale for perceived importance of product/service to portfolio?
- How many years has the product been in market?
- Staffing requirements?
- Benefits to customer and to CIE?

- Primary and secondary customers?
- Challenges?
- Revenue?
- Costs?
- Funding sources, if applicable?
- Contribution margin?
- Potential product improvements?
- Key current metrics for measurement?

Responses were compiled using the results of the BOS analysis from the previous year, feedback from our financial analyst in CIE, research gathered from general market trends, and the impartial opinion of our product management researcher. Based on this compilation, the products/services were situated across the PLM framework (Table 4).

		Development Inception stage	Market Intro Introduction of product to market	Growth Product is well-established in market; market differentiators become critical	Maturity Product is aging; sales are declining	Retirement Repurpose or retire product
Current Product Lifecycle Placement	Thompson Conference Center	Event Planning		Conference Center	OLLI / APSI / Road Scholar / Informal Classes	
	PDC	International	Casa Herrera	Corporate / CPE	Publics / MSHA	
	PETEX			E-Products	Books / Classes	
	K16			High School / LUCHA	Credit by Exam / Testing Services / GED	
	University Extension		Customized	Classroom Based / Online		
	UT-UCS				Charter Program	
	IT				IT	

Table 4: Product Lifecycle Management Framework for CIE

The display showed that in general the CIE product portfolio was healthy and the division was on the right track to ensure that new products/services were coming into the portfolio to supplement and eventually replace those that were aging. We were also able to identify potential problems within each enterprise, product-repurposing strategies, and recommendations for determining when a product was moving into a new lifecycle stage.

For example, the Thompson Conference Center's Osher Lifelong Learning Institute (OLLI, near the top right of the table) is a mature-stage product whose market indicators appeared to be more in line with a product in the market-introduction stage. These indicators included high costs, lower-than-expected profits, and issues with customer support and service. By its very design as a not-for-profit, the program is problematic in a portfolio that must generate an annual reserve. It was recommended that outside donors or alumni be identified to support the program by offsetting the internal overhead and resource costs.

Analysis of the range of PETEX products and services (center row) showed that they straddled both the market-intro and maturity stages. In order to support the unique technology delivery requirements for oil/gas industry clients in remote geographic regions, it was recommended that we deploy a commission-based sales force to reinforce "aging" sales and repurpose products and services. The focus of training will be on new developments in the industry that have an impact on domestic and global markets.

One of the most promising attributes of the PLM framework is that it represents visually an accurate picture of complex organizational structures and portfolio holdings in real time. It also serves as a handy reference visual for executive briefings, annual reports and development initiatives.

PHASE II: ESTABLISHING THE DASHBOARD

To delve further down into the PLM framework, a second phase in the initial case study was launched. This included creating a dashboard of activities within each product lifecycle stage for one of the enterprises. Embedded within each stage of the PLM framework are key areas of focus: Sales planning and valuation, sales and marketing, development, financial, and transition (Table 5). With the exception of the development and retirement stages that have their own unique characteristics, the five areas that occur in each stage are essentially the same. It is within these areas that metrics

and tasks (i.e., the dashboard) must be effectively managed in order to successfully navigate the product through the five PLM stages. The dashboard activity is typically monitored and managed by a product manager, who is responsible for one or multiple product lines for an organization. The dashboard enables high-level evaluation and analysis of program offerings, provides insight into market responsiveness and resilience, increases traction through cross-platform applicability, improves leadership decision-making, and reinforces the organization against marginalization.

Stage 1 Development	Stage 2 Market Intro	Stage 3 Growth	Stage 4 Maturity	Stage 5 Retirement
Concept evaluation	Sales planning and valuation	Sales planning and valuation	Sales planning and valuation	Sales planning and valuation
Planning and specifications	Sales and marketing	Sales and marketing	Sales and marketing	Sales and marketing
Development	Development	Development	Development	Communication
Validation and pre-sales	Financial	Financial	Financial	Financial
Release	Transition	Transition	Transition	End of life

Table 5: Focus areas within Product Lifecycle Stages

For this portion of the case study, K-16 was selected due to its diversity of products and services and resonance in local, national, and international markets. As illustrated in Table 4, K-16 products and services are clustered in the growth and maturity stages of the PLM framework. Mature products typically face stiff competition because those markets are saturated with products. Replacements emerge and further growth is difficult. Although marketing is less important in this stage, pricing is vital. For some K-16 products, identifying and refining their competitive differentiators and adjusting pricing and marketing accordingly are key. Those that do not have as much competition can bear a higher price point and should be marketed heavily to capture as much market share as possible while still in a thinly competitive market. Other products that are in a more competitive market should also focus heavily on marketing, perhaps utilizing their brand as the competitive differentiator. Several programs, while nationally recognized, are either state or federally funded and given the recent state of the economy, might be at risk if funding were to be reduced or cut off entirely. This indicated that K-16 should be (and is) developing and repurposing new and existing lines of business into its portfolios.

Recommendations to K-16's management included completing the reorganization currently underway, cross-training to ensure that multiple staffs are able to work on different facets of the business, and focusing on pricing and market expansion into uncharted areas of the world. Continuing to hire experienced staff will be critical for new contracts. Better utilization of technologies will expedite registration services and make credentialing processes smoother. Additional opportunities might be to pursue additional large-scale testing contracts outside the local area. This would include multi-state K12 scoring contracts in tandem with private providers as partners when feasible.

The dashboards outlined below in Tables 6 and 7 serve as an illustration of the activities that should be undertaken and continually monitored. While developed for K16, any enterprise leader or product manager for virtually any product or service line. The dashboard could be further refined to add key metrics and to accommodate differences and nuances.

Stage 3 (Growth)	
Sales planning and valuation	- Maintain product for long term. - Structure and organize team.
Sales and marketing	- Develop and roll out marketing plan, budget, and strategy annually. - Adjust sales plan as appropriate around ongoing enhancement/ maintenance releases. - Verify strategic fit. - Start seeking enhancements and additions to maximize market opportunities.
Development	- Review and prioritize incoming change requests. - Validate market requirements. - Identify professional development requirements. - Document changes. - Complete product requirements and validate and complete specification document. - Update research as needed. - Complete development and technology. - Complete validation and readiness review.
Financial	- Update financials associated with release and ongoing maintenance. - Validate accuracy of financial assumptions. - Validate and adjust business case as applicable. - Update product roadmap for budgeting and planning. - Update business plan financials.
Transition	- Decide on go or no go.

Table 6: K-16 Growth Stage Dashboard

Stage 3 (Maturity)	
Sales planning and valuation	- Maintain product for long term. - Structure and organize team.
Sales and marketing	- Develop and roll out marketing plan, budget, and strategy annually. - Continue to validate market assumptions. - Seek new markets for the product line. - Adjust sales plan as appropriate around ongoing market changes and product enhancements. - Continue to verify strategic fit and adjust marketing to reach new markets. - Begin to plan for product replacement/retirement.
Development	- Review and prioritize incoming change requests. - Validate market requirements. - Identify professional development requirements. - Document changes. - Seek low dollar enhancements to the product line to attract a new market or extend product life. - Complete and validate product requirements. - Complete specification document for new enhancements. - Look for product repurposing opportunities to expand market. - Plan product replacement.
Financial	- Update financials associated with release and ongoing maintenance. - Validate and adjust financial assumptions and accuracy. - Experiment with pricing to increase sales: Increase pricing to drive customers off market or if market is stable, competitors are scarce, and brand is strong. Decrease pricing if sales are waning, competition is strong, or technology/product is aging.
Transition	- Decide on go or no go.

Table 7: K-16 Maturity Stage Dashboard

Due to the recent release of the initial findings of the PLM case studies, tangible outcomes cannot be documented at this time. The K-16 enterprise is on target to complete their dashboard of activities for each product and service line as well as establish a plan for the transition of products and services across the stages of the PLM framework. Once this is in place, metrics can be used to measure the success of each stage transition as well as identify the nuances of each product and/or service to the individual enterprise and to the entire division.

Observed efficiencies include a greater degree of intra-divisional communication about core competencies and hybrid approaches to similar programs and services that reach targeted markets. In addition, the analysis and findings have led to closing the gaps between customer perceptions and actual deliverables as units begin to reflect on key focus areas of each stage of the PLM framework, to include sales planning, marketing, and pricing.

CONCLUSION

This study and its findings bear witness to the challenges facing institutions of higher education and more especially continuing higher education.

When the National Commission on the Future of Higher Education examined issues related to access, affordability, accountability, and quality of colleges and universities they concluded that higher education was perhaps a mature enterprise, increasingly risk-averse, at times self-satisfied, and unduly expensive: "It is an enterprise that has yet to address the fundamental issues of how academic programs and institutions must be transformed to serve the educational needs of a knowledge economy" (Miller, 2006). Therefore, the BOS and PLM research might have broader application and appeal to not only continuing higher education enterprises but also to traditional higher education administration seeking a new business paradigm.

In a time of dwindling budgets, global market expansion, and burgeoning minority population growth, continuing higher education providers stand to benefit from this emerging system because we are well versed and experienced in drawing students from a changing marketplace (Duderstadt, 2011). We have operated on the fringes, and that has allowed us to innovate and integrate technological advances for changing regional and global markets. We have become the laboratory for ubiquitous learning that is no longer limited by time or distance. We are experts at finding the gaps in learning and filling them with timely, relevant, and results-oriented solutions that change lives.

Expanding our BOS and PLM research agenda will allow us to be more responsive to an increasingly competitive borderless market and provide a template for identifying and deploying best practices across the global marketplace. It provides a transformative model of integrative knowledge that can be disseminated to the continuing education provider for review, comparison, and inclusion in their best practices. Further, ongoing research of how the BOS and PLM integrate into building successful models of continuing higher education will help us to gauge the pulse of society, learn from our mistakes, and share our successes through a network of knowledge partners to ultimately thrive in a changing world. ❧

ACKNOWLEDGEMENTS

REFERENCES

A Communique from the Horizon Project Retreat: Building on ten years of research into emerging technology in education. Retrieved April 28, 2012 from http://www.nmc.org/pdf/2012-Horizon-Project-Retreat-Communique.pdf

Chan, W. K. & Mauborgne, R. (2005). *Blue Ocean Strategy: How to create uncontested market space and make the competition irrelevant*. Boston, MA: Harvard Business Press.

Duderstadt, J. J. (2011). *Higher education in the 21st century: Global imperatives, regional challenges, national responsibilities and emerging opportunities*. Retrieved April 4, 2012 from the Glion VI Colloquium at http://www.glion.org

Duderstadt, J. J. (2010). *A university for the 21st century*. Ann Arbor, MI: University of Michigan Press.

Miller, C. (chair). (2006). A test of leadership: Charting the future of US higher education. National Commission on the Future of Higher Education in America. Washington, DC: US Department of Education.