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Abstract

To succeed organizations rely on the purposeful application of the management functions, planning, organizing, leading and controlling, i.e., assessment. Assessment involves the collection and analysis of service and performance data to inform planning, organizing and leading-- opening the door to a culture of assessment and continuous improvement. Like other organizations responding to ever challenging economies and ever changing customer expectations, libraries are examining continuous improvement methods such as Lean, or Six Sigma, to ensure operations and services are customer focused and can be continuously assessed and improved with limited resources. Librarians though, often lack a general understanding of assessment and continuous improvement methods and may be reluctant to implement. At the Li Ka Shing Library, staff and librarians are taking advantage of the University's Lean Six Sigma green belt certification program to learn the methods of data gathering and measuring performance outcomes to continually assess and improve services and processes, i.e., ensure operational strength (a University strategic initiative). To help staff and librarians tell the story of their improvements and to reinforce management competencies learned in the Lean Six Sigma training, the A3 method of problem solving is being used to report progress and practice demonstrating the value of their contributions to the University's stakeholders.

1   Background

Narrative remains fundamental to our communication needs. We tell stories to interpret what we see, explain what we do, extricate thought, clarify feeling, and entertain. Often a story's effectiveness resides not in how well it entertains, but rather in the cognitive impact it delivers. And we do not limit our storytellers to the world of folklore, fiction and film. Lawyers create narratives to communicate to juries, historians use narrative to weave context and selected fact into interpretations of the past. As Joan Didion (1979) wrote, "we tell ourselves stories in order to live."

In 2013, I was hired by Li Ka Shing Library at Singapore Management University (SMU) to help management develop the professional habits and values of its employees as the University works to create a sustainable culture of assessment. The University had established an Operational Excellence Initiative the previous year, and assessment was deemed a cornerstone of that endeavor. Soon after, a campus-wide Business Process Improvement (BPI) department emerged as the propelling agent to jump start and facilitate the process. The primary goal, wrote the BPI department, centered on the pursuit of "better productivity, efficiency and innovation while engendering team spirit and collaboration across the university." In order to inculcate a "define, measure, analyze, improve, control" (DMAIC) mentality campus-wide, the BPI department immediately made available to University employees a Lean Six Sigma green belt training program.

Such efforts reveal SMU's desire to update its pedagogical and methodological philosophy along lines which have found success in the commercial realm. As a leading business and management university in the Asia Pacific region, serving over 7000 students, its strategic team recognized the purposeful application of systems thinking, planning, organizing, and assessment as fundamental to success in an information market challenged by ever-changing economies and customer expectations.

Building on BPI efforts, library management is working to utilize Lean methodology to position the library as campus leaders toward SMU's operational initiative. In doing so, our library reflects a movement within the library profession as a whole to situate itself in the forefront of applying commercial business methodologies into non-commercial environments.

SMU's BPI language illustrated evolving recommendations supported by the American Library Association (ALA) and the American College and Research Libraries (ACRL). In its *Core Competencies of Librarianship* (2009), the ALA inserted into their competency blueprint four necessary assessment-related aptitudes which, the association posited, librarians need manifest to accommodate an evolving job market. In 2011 the ACRL's *Standards for Libraries in Higher Education* argued that by becoming leaders in assessment and continuous improvement on campuses, libraries enlarged their value to academic communities and thus contribute greatly to overall institutional effectiveness. By 2012, a study confirmed both ALA and ACRL positions by revealing that one third of entry level positions in the field sought candidates with assessment skills (Askew & Theodore-Shusta, 2013), a statistic that infers assessment fluency among mid-level and upper-level staff within many libraries.

Culture of Assessment is defined as an organizational strategy requiring decision-making based on "facts, research, and analysis, and where services are planned and delivered in ways that maximize positive outcomes and impacts for customers and stakeholders (Lakos & Phipps, 2004)." Coming into Singapore to a new position from the United States, charged with introducing such strategies, presented numerous challenges. Our charge at Li Ka Shing Library is to develop managers, librarians and staff into problem solvers, creative thinkers, and risk takers. Toward that end, we intend to produce a staff fluent with the language and methodology of assessment, accountability and transparency.

This paper addresses the use of Lean tools to engage some of the challenges we are encountering in meeting our charge. Many of those challenges have been present in every organization where I have been employed to develop assessment methodologies. Thus, addressing those challenges is a story worth telling because producing change in a work culture begins, like a good tale, with simple, clear language and develops through the ability to articulate what we do as managers and librarians and staff.

Sociologist David Mann defined work culture as the cumulative sum of **each** employee's work habits. It is argued that a Lean Culture does not exist unless **every** member of the workplace routinely uses Lean principles to engage **every** process (Mann, 2010). While I have yet to encounter that ideal Lean Culture, Mann's definition of "work culture" resonates with Lean principles because implementing assessment strategies must begin at the individual process level and with the work habits of each manager, librarian and staff member.

2   Challenges

Implementing new ideas in any environment involves the introduction of a new vocabulary as well as an expansion and contraction of existing vocabulary. Our culture of assessment initiative has as its primary goal the creation of a work environment in which conversation is centered on collaborative decision-making, problem-solving, and value-streaming. It is an inventorial process buttressed by a constant and critical data-driven review of procedure and practice, procedures and practices often ingrained and perceived as successful. It is a process that begins not only through identifying and defining value, but also by prioritizing value within the decision-making process. And through it all, it is the learning of a new way of speaking about and measuring work behavior and performance.

The Lean notion that library patrons are "customers" and librarians purveyor of goods and services challenges how library employees everywhere conceptualize "Library." It means shifting a perception of

the library as a neutral, self-driven, self-replicating resource to a perception of it as a dynamic set of intertwined, customer-focused services. Each commitment to a service must have as its aim the fulfillment of a customer need, regardless of whether that customer is faculty, student, alumnus, donor, internal stakeholder or the University as a whole. Each service requires informed management and the conservation and justification of assets expended to provide it. "Best practices" can no longer remain a phrase confined to management's rhetoric or to a perception of efficiency based on mere compliance to routine; rather, within a culture of assessment, its meaning can be only derived from how responsive services are to the needs of its customers.

Ongoing assessment rejects the contention that a procedure or service is ever finalized. Too often assessment is approached as a summative process where tasks mastered are viewed as tasks concluded. Ongoing assessment and continuous improvement, therefore, contradict learning behaviors that in the past have been understood to be workable and efficient. Lean problem-solving operates on the premise that no problem is ever solved because conditions change and change enters new variables into the environment and a culture of assessment should be designed to locate and even anticipate such eventualities. Impressing upon a work force, at all levels, to move beyond the notion that work processes are mere static constructs which once devised are memorized and acted on when necessary is a fundamental challenge to any assessment implementation.

Consequently, reliance on customer research and customer feedback is paramount to the decision-making process. Data driven information provides the forensic tools to uncover problems and proffer solutions. In a university library environment, a culture of assessment exists when staff prioritizes knowing its usage statistics and user patterns; where access to limited materials is provided to the greatest number of customers; where classroom curricula and data usage is connected to acquisition choices. It exists where librarians team with faculty to facilitate information dispersal; where operational hours are conducive to student timeframes not procedures established in the past. It exists where students' preferred reading formats and habits are understood; where alumni privileges are acknowledged and valued; where donor relationships are examined and improved. Such an environment necessitates pro-active professionalism and management needs to lead by example.

Asking managers and librarians and staff at La Ki Shing Library to now produce data to explain their current processes and practices created an unfamiliar set of challenges for them. Although they proved quite adept at running reports and gathering data, interpreting the story the data told created impasses. Unaccustomed as they were to measuring performance, being now asked to take interpretive ownership of processes at the data and statistical level, such requests represented a shift in their operational methodology. Their initial reaction involved considerable skepticism. Some saw the request as additional work while others interpreted it as a form of micro-management which contradicted the charge that they take ownership and manage processes. Overall, such data requests were perceived not as a means to improve service but rather to criticize performance.

These employees perceived the word "problem" as an indicator of poor performance, whereas Lean recognizes a problem as the mere difference between a current situation and a target state. The very word "problem" itself, to this staff, signified failure. A communication strategy that spoke of problem-solving and customer focused service engendered conflict and conflict was viewed not only as unprofessional, but also as a byproduct of performance at odds with management.

These tangles over meaning have consumed valuable time, but often times are expected phases during paradigm shifts of this nature and is why language and meaning play such vital parts in the quest for organizational change. Management must be firm and consistent in ensuring that the language of Lean seeks the enhancement and development of already committed professionalism; that its vocabulary strives to position the library as active agent promulgating the university's mission and delivering to its student body quality and quantifiable and ubiquitous access to resources necessary for matriculation. Thinking of, speaking about, and defining processes in terms of problem solving and customer value must be constants.

The implementation of a culture of assessment is not a pie-in-the-sky pursuit. Our goals seek to replicate fundamental practices current throughout much of the business community, and as crucial players in the information marketplace, universities and libraries need master them. Establishment of a culture of assessment leads to a culture of life-long learning through collaboration, engagement and outreach. Using innovative and leading edge concepts and tools, our goals represent fiscal responsibility, waste reduction, and a commitment to delivering seamless access to exceptional services while building dynamic relationships within the SMU community and beyond and we seek to do so through institutionalizing data-informed decision-making.

The challenge for upper management to bridge the language and perception gap before us is not one that will be, nor can be, overcome library-wide in one fell swoop. Such a challenge depends on small victories, it anticipates setback. It relies on institutional support. We acknowledge that one department will assimilate the new conceptual language to transition before another department. This is occurring. The classroom is always an uneven learning environment, and so keeping the various wings of the library aligned, while not restraining staff that are advancing, presents yet another problem-solving condition.

The line between resistance to change and receptiveness to change is narrow and tenuous and easily vexed. Occasionally impatience has led to a reversion to directive management tactics, which, likewise, means in a properly functioning Lean environment, such tactics are problems to be identified, measured and acted on. Successful countermeasures cannot emerge when inconsistencies cloud the situation. The DMAIC framework is rigorous and its implementation time-consuming. As staff learns Lean and cause-analysis tools, as they learn to efficiently frame the gap between current state and standard state, the adjustment and learning curve can overwhelm them and jeopardize sustainability and so consistency is crucial.

3   Countermeasures

Sometimes the most effective methods of transitioning out of old ways of thinking or for introducing new conceptual goals emanate from the simplest of methods. Likewise, tackling small and relatively innocuous issues, when using new tools, develops staff competencies and produces learning outcomes which exceed the value of eliminating the problem. The Lean Six Sigma program offered by BPI, in conjunction with staff training in information literacy assessment, problem-solving techniques, customer-focused writing, and data-driven decision-making have cumulatively prepared staff for use of A3.

The A3 'storytelling and problem solving' method is helping our library overcome obstacles which have emerged as a result of our efforts to implement the University's operational initiative. Its structured framework and its visual management interface have provided staff with a means to creatively unite the language of Lean and data-research to individual daily processes that are fundamental to their work day. Its situational objectives teach staff to diagnose small issues, practice cause-analysis and better understand customer perspectives. Assessment begins by developing such competencies.

There is nothing overwhelmingly complicated about A3 methodology. It represents a condensed version of the Six Sigma DMAIC framework. It is a reporting mechanism augmented by a well-structured framework that serves as a storytelling guide. The A3 is centered on Plan-Check-Do-Act (PDCA), a key facet of any customer-focused process improvement or problem-solving methodology. A3's compactness, relegated to an 11x17 inch piece of paper, demands conciseness and helps direct interrogation of a problem or process while keeping it from extending beyond manageable boundaries. Lastly, the A3 makes the endeavor visible and transparent to the team and the whole organization.

The ability to verbalize existing processes and describe current tactics facilitates staff involvement in those processes and is fundamental when diagnosing time-consuming and outmoded processes. Recognizing and eliminating waste is the definition of Lean and using assessment behaviors to identify waste instills confidence in ownership of duties and thus in contributions to the overall mission.

Asking staff to verbalize ideas, perceptions, observations, and activities at a group level remains one of our biggest challenges. Accustomed to hierarchical communications, to expecting management to carry

the weight of communication, their professional experience trends more to output than explanation. But now they are being asked to explain procedures and activities in front of supervisors and peers and to do so within the context of critical problem-solving. Group presentations posed challenges in itself, but being asked to problem-solve work-flow tasks which they felt were already being administered effectively and proficiently impeded their willingness to embrace the utility of the process.

Given such communication hindrances, A3 has been beneficial because it emanates out of small group efforts and only gradually draws in larger communication chains. Starting within a comfortable unit, A3 provides process owners and project leaders an approach to language that engages verbal expression to move beyond the sentence boundary. The A3 template is divided into titled sections where each part of the story is expected to situate. One half of the template is set aside for diagnosing a process and defining the causes behind a problem, and the other half operates to suggest approaches to confront the conflict. The use of graphs and graphics are encouraged. Thus the A3 provides a semiotic storyboard enabling staff to insert facts, research and statistics culled into a narrative of the process or service they are engaging.

That A3 is analogous to storytelling in no small way is a facet of its effectiveness. Everyone understands the structure of a story. A character is introduced, a background explained, a point of conflict in the character's life emerges. The character struggles to overcome the challenge. Other characters enter the picture and expand the complexity of the situation. The writer provides flashbacks into the character's past to explicate influences and causes which may have led to the current situation. The character, influenced by other characters and events, confronts the dilemma and either overcomes it or is stymied by it. Either way the process has impacted the character and has involved comprehension and growth, even when the outcome falls short of great expectations. The story segues into a final act but it does not necessarily end at the last period. It remains with the reader and is discussed among other readers. Each reader may focus on aspects of the story which has stayed with them and in doing so propel that aspect into extended discussions, observations and conclusions.

Like a fictional story, A3 offers its writers and readers a toolbox of storytelling devices. There is a standard structure to the A3, most implementations use roughly a consistent ordering of components which go by such labels as theme, background, current condition, goal, root analysis, countermeasures, effect confirmation, and follow-up actions. While our early uses of A3 have tended to follow that order and pattern, many of our managers and staff are experimenting with telling their stories in flexible and non-linear ways which deviate from the standard A3 format.

The theme of an A3 is a problem statement which serves as title and introduction and is consistent with the main character of a story. The theme or problem can be simple or involved. Examples posited by our staff include: students have trouble differentiating between 3 day loans and other short term loans; the print collection is currently underutilized indicating that it is not as customer-focused as it should be; the lack of clear policy and procedures regarding acceptance of gifts has created a significant backlog of items with seemingly marginal value to the collection; issues regarding e-books challenge the library's ability to achieve seamless and ubiquitous access to resources; the practice of reviewing shelf-ready cataloging records delays access to new resources; bottlenecks occur each term when faculty wait until the last minute to submit reading list requests to Course Support Services (CSS).

Planning to resolve such problems consumes the largest part of the A3 framework or storyboard. The structure typically governing the A3 planning process begins with providing background information essential for understanding the extent and importance of the problem. The current condition uses charts, tables, graphs or other techniques, to illustrate the story in its present state. At this point a goal is posited to address a basis for comparison to be used determining the success of the assessment and improvement process. Using flashback devices predicated on who, what where, and when questioning, the root-cause analysis section investigates the current condition until sources of the problem emerge. With the conflict identified, the problem understood in terms of currency and history, and a future in mind, the story is set for process improvement and problem resolution.

4　Case Example

Each term faculty submit reading lists to our CSS department, which responds by adding selected print resources to reserve collections for short term access. In addition, persistent links to articles are created within the e-Learn system, printed course packs are assembled and distributed, and additional identified textbook chapters are scanned and uploaded to e-Learn. Often faculty reading lists arrive last minute, causing workflow bottlenecks as staff struggle to accommodate student needs and schedules.

Identified as a problem, initial reactions emerged. Our CSS Manager proposed reduced service levels for untimely requests. Senior management sought that reduction through increased reliance on course reserves. While acknowledging that some issues existed in CSS workflow, staff with BPI training voiced concern that the 'real' problems remained unidentified and suggested A3 to investigate and determine if a problem existed and if so its nature and extent.

Looking to administer Band-Aid repair to a misunderstood, non-delineated problem, early discussions focused on process efficiency, omitting any discussion of the relationship between service and customer. To refocus efforts toward Lean principles, a reading list value stream team sought to articulate the purpose of the service, its goals, the values and benefits it offered identified customers and stakeholders, and the challenges and constraints it presented. That team reviewed professional standards, created a functional activity flowchart and interviewed customers and stakeholders. Surrounding all that activity, the team also charged itself with identifying learning objectives to be derived from the investigation.

The current condition suggested staff levels could not keep pace with a workflow determined by untimely faculty input. Surveying other university libraries, staff affirmed our standard that faculty requests are met for scanned, cataloged and uploaded materials each semester. To overcome the incongruity between the perceived current condition and the standard, librarians began by connecting the creation of CSS to a 2006 mission objective of providing students seamless, ubiquitous access to course materials while simultaneously managing copyright requirements. Over time CSS had made numerous changes and adaptations to its process, but the original mission objective remained intact.

But how did both the existing objective and its current implementation comport to current student expectations and needs? Here staff assembled data from 2006 to the current semester to measure the duration of the bottleneck period, the average number of chapters processed per term, the average time needed to accomplish batch processing, the levels of reuse for already scanned chapters, the number of courses utilizing e-Learn, enrollment in those courses, usage statistics on scanned chapters and the costs for the overall service. In addition they conducted surveys to obtain the voice of the customer and queried customer service staff regarding problems and complaints conveyed to that service.

The resulting data concluded that the service was a low effort and low cost process that provided high value benefits. Customer focused, data-driven measurements had prevented a perceived problem from needlessly altering a service. The countermeasures and process proposals they devised sought to improve liaison between librarians and faculty and put the onus of improving scheduling, planning, and communications on improved collaboration.

In the end, although the process remained part of CSS workflow, and actual improvements to it were minimal, the learning outcomes garnered from the entire investigation were great. Staff relearned why the service was originally implemented. Strategies on how to articulate value from customer and stakeholder perspectives, as well as how to incorporate those values into recommendations, were practiced.

The A3 structure enabled them to convince stakeholders that they had done the necessary leg work to identify all facets of the issue, to identify potential causes of, and enumerate possible solutions to, each facet. Finally, the A3 helped them to make decisions and commit to actions to address proficiently the relationship between CSS, scanned chapters and customer value.

Additionally, investigating a perceived problem with a minor service opened eyes to how interconnected their workflows were to both external and internal processes. Librarians learned the process is an opportunity to increase faculty engagement in their workflow. It opened their eyes to exploring how they

can further assist faculty goals and simultaneously carve out roles in curriculum development. Internally, a communication-loop between CSS and librarians has been augmented and strengthened.

Lastly, staff empowerment emerged from the process because the data gathered determined the decision. Thus the effort reinforced the importance of data-driven decision making and spoke to management's commitment to instill a Lean environment where decision making structures and process ownership are not directive but rather data and value based.

5   Conclusion

A culture of assessment can persist in a library environment where the institution and its management assure that objectives and values presented to its staff find support within a "performance and learning focused" (Lakos & Phipps, 2004) environment. Devising workflow situations which allow staff to put Lean tools and techniques into practice is fundamental toward that effort. The A3 storytelling method instructs while it works to improve. It offers staff a better understanding of organizational interrelationships and new and innovative ways of working together. Most usefully, it teaches not only how to articulate processes or services, but also how to define value. In the process, it prepares for engaging larger processes using full-blown BPI projects.

Statistics reveal that implementations of Lean and assessment-based strategies within organizations are difficult to sustain over long hauls (Liker & Rother, 2011). But they are strategies that improve organizations. Sustainability can never be attained unless assessment is manifested at basic process levels and comes to be internalized as habit and as measures of accountability across an organization. A culture of assessment begins with organizational commitment but it finds first expression at basic process levels through the use of new ways of defining and speaking about how we tell the story of what we do.

From that perspective, and to take liberties with Mann's definition of work culture, allow me to suggest that a work culture is the sum of the stories an organization tells and shares among itself. Such telling and sharing produces transparency. It opens eyes and minds to connections and observations that help overcome the waste and repetition that arises within organizations which have privileged output over outcome.

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