

**ENGAGING STAKEHOLDERS, STUDENTS, FACULTY AND LIBRARIANS TO
IMPROVE THE READING LIST SERVICE AT SMU LIBRARIES:
A LEAN CASE STUDY**

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ABSTRACT

A current trend in Libraries is to use Lean to improve processes and services while doing more with less. The SMU Libraries has been on a Lean journey since 2013, partnering with the Office of Business Improvement to train Library staff in the use of Lean Six Sigma to improve productivity and service levels. Recently, the SMU Libraries and the Office of Business Improvement collaborated with students enrolled in the Managing Process Improvement course to review one of the key services provided to students and faculty. The team applied the Lean Six Sigma methodology to the Reading List service, looking closely at the persistent link and scanned chapter workflows. The goal of the project was to reduce the lead time for the Reading List service. This paper presents a case study to illustrate the application of Lean Six Sigma tools in identifying and investigating the root causes of the problem, analysing the process metrics, prioritising potential solutions, running experiments and creating a control plan to sustain the improvements. Based on the information given by SMU Libraries and faculty members, the students suggested some alternatives to improve the processes and conducted experiments to test their recommendations. The project quickly resulted in better engagement between the Libraries, faculty and students and showed early indications of faster turnaround time by faculty, enabling the Libraries to provide better service to both faculty and students.

KEYWORDS: *Lean, Stakeholder Engagement, Library Services, Continuous Improvement, Library Assessment, Performance Measurement*

INTRODUCTION

Singapore Management University (SMU) Libraries consist of two libraries, known as Li Ka Shing Library and Kwa Geok Choo Law Library. Kwa Geok Choo Law Library is the latest addition to the SMU Libraries, opening on 3 January 2017. Services are centralized and include Research Consultation, Interlibrary Loan, Document Delivery Service, Lending, Items Reservation and Reading List Services. The Reading List Service includes Scanned Chapters, Persistent Links, Course Packs and Course Reserves. The Scanned Chapters involves checking the copyright rules, scanning, photocopying and uploading the copyright materials into an online platform called e-Learn. The Persistent Links involves providing the persistent links of online articles that are available in the library collection. The Reading List Services team assists in buying cases and makes them ready for students to purchase at the beginning of the term. The team also works with faculty, academic support staff and teaching assistants to acquire textbooks for the courses offered in SMU. These textbooks will be placed in the Reserves section in both Libraries and are accessible for students to borrow for a 3-hour loan period.

The Office of Business Improvement (OBI) is a department in SMU dedicated to working with the schools and other offices across the University in a joint effort to improve effectiveness and productivity. OBI's core services include leading Lean Six Sigma (LSS) Black Belt projects, training and coaching LSS Green Belts, managing improvement projects and building a culture of continuous improvement through active engagement of stakeholders and sharing of best practices.

The SMU Libraries has been on a Lean journey since 2013, partnering with the Office of Business Improvement to train Library staff in the use of Lean Six Sigma to improve productivity and service levels. According to Cribb (2017), over eighty percent of the staff of SMU Libraries have attended training in Lean Six Sigma (Green Belt). Since 2013, SMU Libraries have applied the Lean approach to improve the library services.

In January 2017, the SMU Libraries and the Office of Business Improvement collaborated with students enrolled in the Managing Process Improvement course to improve the Reading List Service, one of the key services provided to students and faculty.

PROBLEM STATEMENT

Reading lists play an important role in resource sharing and fostering meaningful learning experiences for students. In an academic year, the Library will process the reading lists for 200 faculty members and process over 500 digitized resources that require copyright management, over 1,000 persistent links to library resources and 400 course reserve titles. The process of preparing and delivering reading lists to students is very labour-intensive. Faculty build their reading lists by getting materials from various sources manually. A number of services provided by the library to support this exercise are manual processes and prone to delays due to a number of factors.

About two months before the academic term starts, the “Call for Course Reading” email will be sent out to faculty. However, faculty members usually submit their reading lists one day before the start of the term or even later. Due to late submissions by faculty, Library staff has very little time to prepare the necessary work. There are times when backend tasks such as book orders, course pack preparation and eLearn material preparation have to be expedited in order to make sure that the students are able to access the reading lists on time. This and a host of other things that need clarification before the course readings can be processed cause delays in the reading list service.

METHODOLOGY

The student team applied the Lean Six Sigma methodology taught in their Managing Process Improvement course to the Reading List service. Using the Lean Six Sigma methodology will allow the students to apply the easy-to-understand principles and techniques to improve the Reading List Service (Tamera, 2011). DMAIC, as it is known, is a five phase methodology which uses a scientific and data driven approach to find the optimal solution to a business problem. It is an improvement process model that uses data as a quality strategy. DMAIC is an acronym for the five phases that make up the process:

the Reading List service across 2 academic terms, 6 schools and 13 course types.

As shown in the run chart below, there is a huge variation among faculty in terms of the total lead time for the entire process.

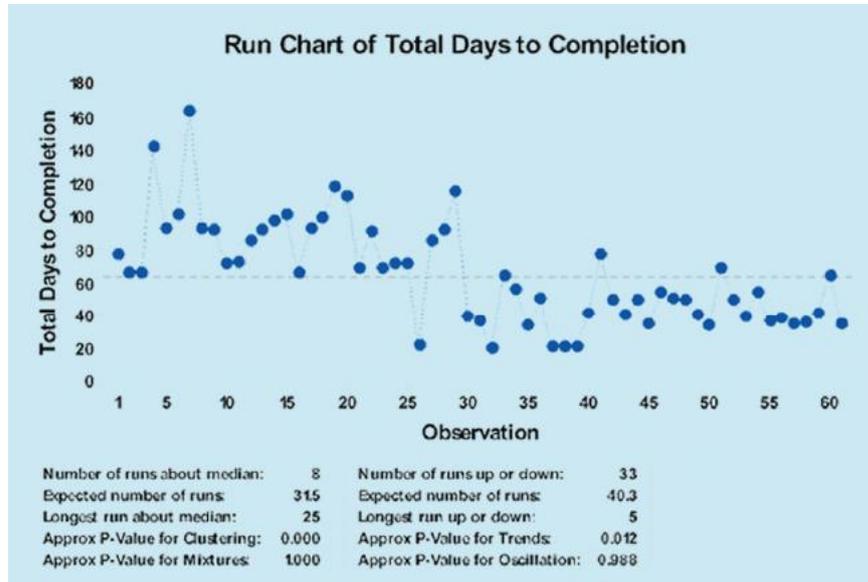


FIGURE 2 Total Days to Completion

The timestamp information for each process step is captured through email exchanges between Library, faculty members and the IT department. Although the manual extraction of data is tedious, the source of metric information is nevertheless stable and reliable. In the absence of an automated system, it will be too time-consuming to monitor the duration of each process step but getting the start and end dates of each transaction is doable.

3. Analyze

The Analyze phase aims to identify and verify the critical factors that impact the key project outcomes. Most of the crucial data analysis is performed at this stage. This phase usually leads to exposing the root causes of the problem and provides insights into how to eliminate them.

After gathering inputs from process maps, the team also facilitated a brain writing session with the Librarians using a tool called KJ Analysis. The question asked was: “Why does it take longer than expected to prepare the course readings”. The main takeaway from the session is that: The main cause of delay

is lack of timeliness of faculty responses and this could be due to faculty concerns and technological issues.

The inputs gathered so far have all been from the side of the service provider, SMU Libraries. To get feedback from the faculty side, the students interviewed select faculty members. Some of the concerns raised were: Faculty members were unaware of what they need to do; some of them missed the email as they were away during the period it was sent. Their inputs have been added to the Affinity Diagram shown below.

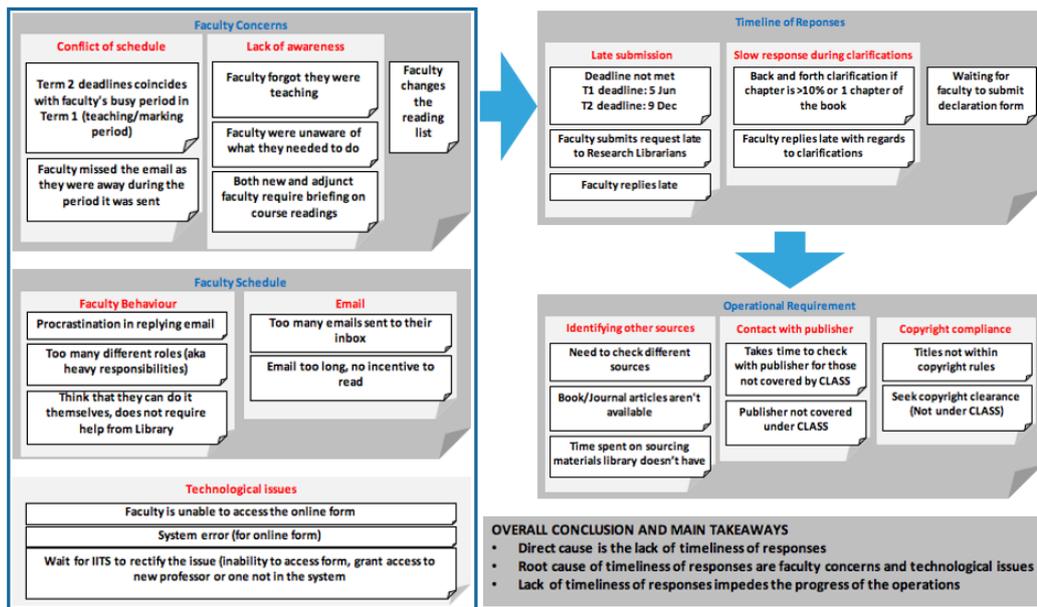


FIGURE 3 Affinity Diagram

The students also conducted Cause & Effect analysis sessions with the library team. A total of 28 distinct inputs were laid out and each was rated according to their impact to the relevant outputs. Figure 4 below shows the Cause & Effect Matrix and the Pareto diagram highlighting the inputs with the highest correlation scores. These inputs were down selected for further investigation.

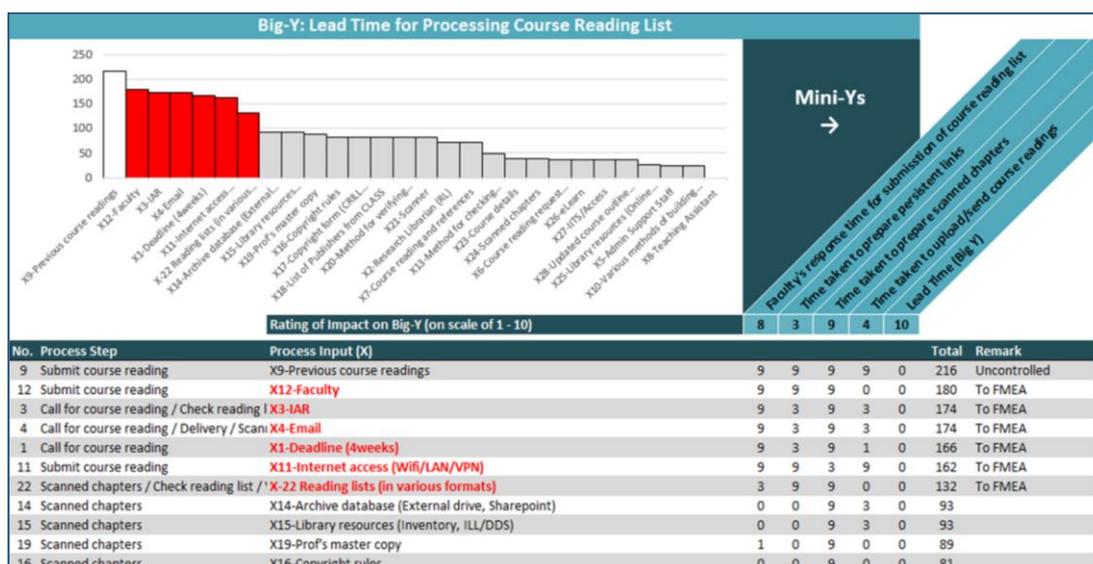


FIGURE 4 Cause & Effect Matrix

The team continued with their qualitative analysis by facilitating a Failure Mode and Effect Analysis (FMEA) session. Process FMEAs analyze the key inputs and potential failures of each step of a process, and consider the effect of process failure on the service concerned. After the session, the team identified the following as the top potential root causes, all of which are related to the most critical factor, **Faculty**:

- Faculty submits after the term starts
- Faculty is uncontactable
- Faculty ignores/misses email
- Procrastination on the part of faculty
- Conflict of schedule
- Faculty is away or on leave

Based on historical data provided by SMU Libraries, the team tested a number of hypotheses including the following:

No.	Null Hypothesis (H ₀)	Alternative Hypothesis (H ₁)	Method	Result
1	Early submission does not reduce average lead time	Early submission reduces lead time	2-Sample T-Test: P-Value < 0.05	Reject H ₀
2	Decreased number of email exchanges does not reduce average lead time	Decreased number of email exchanges reduces average lead time	2-Sample T-Test: P-Value > 0.05	Do not reject H ₀

TABLE 1 Hypothesis Testing

The students also ran a survey and reached out to 360 faculty members. They got 62 responses with survey completion from 59 full-time faculty members and 3 adjuncts. 75.81% of them have been teaching in SMU for more than three years. Table A-1 lists the survey questions sent out to the participants. From the survey results, the key findings and insights can be illustrated as;

- **Q1, Q2, Q3;** A vast majority (91.4%) of the respondents check their emails more than twice a day. Consider revising the email header to encourage more immediate action.
- **Q4;** With the exception of 12pm to 2pm and 6pm onwards, faculty usually check their emails during the remaining of the time periods. Avoid sending emails during lunch time (12 to 2pm) and after work (6pm onwards).
- **Q5;** 80% of our respondents decide to get back to the email at a later time. A process of submitting the course reading has to be simplified. A more urgent call to action also has to be reflected in the email.
- **Q8;** 21.8% indicated that there were too many actionable items within the email, and clarity can be improved. Revise the email to be more direct, with clear and simple actionable items.
- **Q9, Q10;** More than half (53.4%) of our respondents know if they will be requiring the service before the 'Call for Course Reading' and have either usually (39.7%) or always (16.4%) prepared the course reading lists prior to the call. Thus, gather an initial expression of interest for the course reading service, prior to the call for course readings, such that the Library can have a more accurate forecast of manpower hours needed.
- **Q14;** 54.8% were familiar with the librarians managing the service. Increase the awareness of the roles of library specialists and research librarians amongst the faculty, such that they know who to go to for a certain category of issue.
- **Q16;** 77.5% of the respondents felt that a standardized template will help. A standardized template with the flexibility of uploading of supporting documents is welcomed.
- **Q17;** 67.6% feels that the CLASS list will help in their preparation. Concerns include, teaching materials should not be restricted to those under the CLASS list, and that they do not think it is their

job to know about this. The team thinks the CLASS list should be provided, but educating the professors on how to interpret it is required.

- **Q18;** The idea of re-using previous reading lists or a template was the best received, with 87.5% of the respondents liking it. Other better received ideas include importing the list onto eLearn (75%), automatically creating/updating of reading list (60.9%) and the tracking of views/downloads of specific ideas (67.2%). Most professors do not change their reading lists that often, resulting in them wanting to just reuse the reading list. Integration of various systems would help, which includes eLearn, the creation of reading lists and submission of course outlines.

4. Improve

The Improve phase aims to develop, select and implement the best solutions, with controlled risks.

The team came up with a number of potential solutions based on insights generated from the survey results, investigation and best practice research findings. After evaluating against key criteria using a tool called Pugh Matrix, the team concurred that it is more effective to combine several of the solutions and implement them together.

The team proposed to convert the 'Call for Course Reading' email to an infographic, incorporating an Express Interest function that will allow the faculty to express their interest in availing of the Reading List service. The infographic includes the link to the standardized submission form. The FAQ and the list of approved publishers from CLASS will also be attached to the infographic. It was also proposed that the Call for Course Reading be sent two weeks in advance. The template in Figure 5 below has been approved by SMU Libraries for immediate implementation in Academic Year 2017/2018 Term 1.

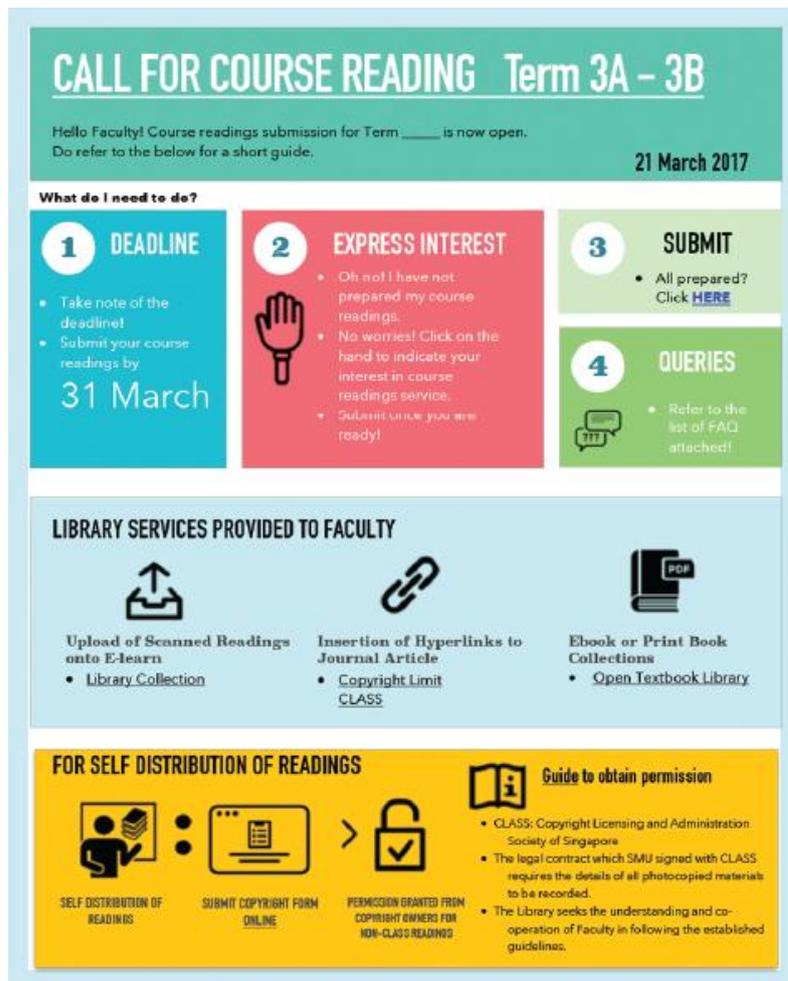


FIGURE 5 Call for Course Reading Infographic

The team piloted some of the improvements in Academic Year 2016/2017 Term 3A. SMU Libraries sent out the revised email reminder to faculty and attached the standardized submission form, FAQ and list of approved publishers from CLASS. SMU Libraries immediately got 3 responses along with feedback on the standardized submission form. The feedback was considered and further improvements were made.

5. Control

The Control phase aims to ensure that the solutions that have been implemented become embedded into the process, so that the improvements will be sustained after the project has been closed.

The team handed over the solutions to SMU Libraries—the infographic template, standardized submission form, FAQ, simplified workflow

documentation. The following Control Plan was also presented to and well-received by the Library team.

Process Step	Critical X/Y	Control Method	Details of Control	Reaction Plan	Responsible / Accountable
Call for Course Reading	X12-Faculty	Visual Control – Infographics	To be included in the FAQs. Illustrates process flow, what is required at each step. Helps faculty understand the intricacies that they be unaware of.	Clarify with faculty	Library Specialist
Submission of Course Reading	X12-Faculty	Dashboard – QlikView	<ol style="list-style-type: none"> 1. Monitor “Express Interest” responses, submissions (number, response time) 2. Send a reminder email to all 2 weeks before the deadline, and once more to those who have indicated interest 1 week before 	Highlight to respective Research Librarian	Library Specialist
Call for Course Reading	X4-Email	Documentation – FAQ	<ol style="list-style-type: none"> 1. FAQ to be included as part of the call for course reading email 2. Review the document every term to reflect updates 	Clarify with faculty	Library Specialist
Submission of Course Reading List	X22-Reading Lists (in various formats)	Documentation – standardization	<ol style="list-style-type: none"> 1. To be included as part of the Call for Course Reading email 2. Required fields within the form to ensure that appropriate information is captured 3. File uploads are restricted to MS Word documents 4. Format for requesting textbook titles are guided as well 	Clarify with faculty Review and alter the form according to the feedback of faculty Long term: Incorporate in RLMS	Library Specialist

TABLE 2 Control Plan

CONCLUSION

SMU Libraries, being proponents of Lean, have always been open-minded to new ways of envisioning their work. Change is inevitable to the organization and they are aware that they need to keep improving in order to provide high quality services to the SMU community. The students and staff members worked well together and established a good relationship. The students were also able to leverage on their relationship with their Professors who have been supportive of this project. The SMU Libraries in turn benefitted from this by getting constructive feedback from the faculty. This turned into a virtuous cycle as the project ultimately aims to provide better service to faculty and students.

The students were very pleased as well to have applied what they learnt in the classroom in solving not just a real-world problem but one that involves their own community.

Running this Lean Six Sigma project to improve SMU Libraries' Reading List service was not about completing every step of the DMAIC model, but more of teaching people to see waste, the evils of variation and value and non-value added tasks. Lean Six Sigma need not be perceived as bureaucratic. Be flexible to what makes sense.

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APPENDIX

No.	Survey Question
1	The above shows the Email Header for the Call for Course Reading email. When you receive this email, how likely are you going to read it immediately?
1	The above shows the Email Header for the Call for Course Reading email. When you receive this email, how likely are you going to read it immediately?
2	If you chose options "Very unlikely" and "Unlikely", what are some possible reasons?
3	On average, how often do you check your emails a day?
4	When do you usually check your emails?
5	Upon reading this email, what is your immediate response? (If you have been using this service several times, choose the option that is more relevant for you)
6	You selected "You decide to get back to it later", approximately how long do you take to get back to the email?
7	What are the possible reasons why you took the stated amount of time to get back to the email?
8	Based on the email above, are you clear on what is required from you for the service? (If "No", please state why)
9	On average, when do you know that you require or not require the library services?
10	On average, how often do you prepare your course reading lists prior to receiving the email?
11	On average, how long do you take to prepare your course reading list?
12	What are some of the reasons why you chose the duration stated above to prepare the course reading list?
13	What are your current views on the course reading submission process?
14	Are you familiar with the librarians who manage the course reading list service?
15	Have you ever made adjustments to your course reading list even after you have submitted?
16	Do you feel that having a standardised template for submitting the course reading list will simplify the process?
17	The Library proposes to provide faculty with the list of approved publishers from CLASS. Do you feel that this initiative will help in your course reading list preparation? If not, why?
18	How likely are you in welcoming a system that will allow you to do the following: a) Automatically create/update reading list

	b) Import reading lists into E-learn (LMS) c) Create structured, Annotated reading lists d) Re-use previous reading lists or template e) Track views, downloads of specific items f) Allow students to give feedback, rate/star/like on specific items on their reading lists
19	Full-time/Adjunct
20	Duration of Teaching in SMU
21	Frequency of Usage of Course Reading List Service
22	Based on the email above, are you clear on what is required from you for the service? (If "No", please state why)
23	On average, when do you know that you require or not require the library services?

TABLE A-1 Survey Questions