

## From the Head to the Heart: A Case Study of the Start-Up Year for Lean Six Sigma in University College Dublin

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### Abstract

**Purpose:** The purpose of this paper is to reflect back on the first year of running a Lean Six Sigma programme in University College Dublin. This year begins after the decision to run a process enhancement and culture change project using Lean Six Sigma has been taken, a high level implementation plan signed off, and the UCD Agile support unit created.

**Design/Methodology/Approach:** The author presents year one - the setup of UCD Agile, the project cycles delivered, the experience gained, and the lessons learned. We used a 'start small and grow' approach to drive three things - to begin to deliver direct process enhancement value, to grow our support and training for this work, and to gain the learning needed to plan and manage the developing programme.

**Findings:** Lessons from the first year: hands on experience inspires; neither need nor strategic imperative are strong enough, on their own, to overcome institutional inertia; the nature of the organisation is revealed by engaging with it; there is a largely untapped pool of enthusiasm in need of nurturing; creating a reflective space in which to learn is necessary.

**Practical Implications:** Moving forward we are; introducing a continuous improvement lead in each support unit; using yellow belt cluster projects to drive training penetration; developing a community of practice model to sustain learning; building a university wide initiative to promote lean/Agile practice.

**Originality/Value:** This case study looks at how you take the lead role in implementing a continuous improvement initiative. The institutional 'head' has reflected and made its decision and as programme lead you have to connect the 'head' with the 'heart': connecting a logical decision with daily reality; connecting the management 'head' with the wider organisational 'heart'.

**Keywords:** Lean Six Sigma; start small and grow; community of practice; customer focused, value driven.

**Paper Type:** Research

## 1. Introduction

University College Dublin is a 160 year old research intensive Irish university with its main campuses in Dublin, Ireland. It has 28,000 students and 3,500 faculty and staff in Ireland, with approximately 25% of students and faculty being international.

Our current President began his term in early 2014, publishing a 2015-2020 strategic plan in November 2014, a plan with ten objectives supported by six strategic initiatives, one initiative being 'increasing agility and effectiveness'. The Deputy President and Registrar (a single academic role) sponsors this initiative and by June 2015 had completed its implementation planning. At the heart of the plan were two elements - to use Lean Six Sigma as the philosophy and methodology for this initiative, and to support its implementation by creating UCD Agile

- (i) as a support unit rather than an internal resource team,
- (ii) having three staff, including one office manager,
- (iii) led by a senior administrator reporting to the Deputy President, and
- (iv) with its own distinct presence and profile.

The purpose of this paper is to reflect on the first year of running this Lean Six Sigma programme in University College Dublin - with 'year' being from January 2016 to mid-March 2017.

(UCD Agile was chosen as the unit name for two reasons - 'agility' was in the originating strategic initiative title and 'agile' means flexible and responsive, just what we want our processes and procedures to be.)

## 2. Start-up Phase

This case study is a personal story – mine as director in beginning and developing UCD Agile, the President and Deputy President's as they created and shaped the initiative, the support units managements' as they engaged, as well as the faculty and staff that have been involved so far. Change programmes are institutional but also always personal.

My starting point was that the decision had been taken, the implementation plan agreed, the unit provided for, the post of director created, and I had been appointed: this is about delivering a plan not taking the original decision.

Now consider the following narrative flow:

- those who took the decision did so on the advice of those who researched the options;
- the research had produced logical and compelling conclusions;
- the working assumption when looking for an approach was that Lean would be the answer;
- the starting point was that there was a 'question' to which Lean was the 'answer';
- the 'question' was framed as the need for a long overdue root and branch review of UCD's processes and procedures;
- however there had been no broad and systematic thinking on what this 'question' meant, no shared analysis as to underlying issues.

Thus the 'head' has acted as it prudently should - a clear decision on a clear proposal – but without there being a deep understanding of the problem or of the implications of trying to solve it - the 'heart' was not engaged. This is not to criticise the decision making process just to note that this created the following starting point for the Director of Agile:

- the justificatory thinking has to be recreated;
- the problem has to be identified and articulated;
- Lean Six Sigma needs to be reframed as the solution;
- the reflective environment needed to understand the real issues, and the challenges in solving them, need to be created;
- the institution's commitments (as promised in the strategic initiative) must be met;
- the implementation plan that created UCD Agile must be delivered; and
- my own commitments ('I can and will do this job') must be met.

Starting in October 2015, by January 2016 the following were in place:

- the steering committee;
- the initial plan to autumn 2016;
- the two other staff recruited;
- training supports (external) procured for first iteration of projects;
- unit space identified; and
- many, many conversations held across the University and externally.

The approach was to 'begin small and grow', broadly using the 'plan do check act' model to drive learning through doing. Eric Ries in *The Lean Startup* (Ries, 2011), particularly the focus on learning as a key output of starting up, was an inspiration in this regard. As we started we set three goals for all projects, for all phases of projects and for the running of UCD Agile itself:

- to deliver the direct value of a given project;
- to build skills and experience through projects; and
- to learn as an input to planning and managing further work.

As we started work in 2016, it was also important that we begin visible activity given the strategic plan had been published in November 2014.

## **2.1 The First Year**

The plan for the first six months was to use a cycle of LSS green belt (DMAIC) projects, running March to mid-summer 2016, in order to:

- create UCD stories of using Lean Six Sigma;
- raise profile and draw focus through project success and training;
- learn how to bring training to bear and the resources needed;
- provide inputs to support a full public procurement process for training resources;
- learn how the UCD Agile unit would support projects;
- explore how the University would engage with this endeavour overall; and
- develop and bring a UCD Agile strategic plan to steering by May 2016.

Seven trainees began a green belt project training cycle in March 2016 – the first pathfinder phase of projects. The green belt training, requiring project leads to successfully deliver a 4 to 6 month LSS project, was two days a month from March. Trainees received mentoring both as part of the training programme itself and from UCD Agile. These projects triggered associated yellow and white belt training, providing a multiplier effect which gave training and project exposure to over 50 staff in the first six months. The first cycle of projects ran from March 2016 to August 2016.

Projects were gently solicited from the support units on the following basis:

- To be delivered in first half of 2016 i.e. build early in-house success stories
- To have a clear end customer i.e. begin the move to ‘customer focused, value driven’
- To deliver broad and visible value to the UCD community e.g. not hidden back office processes
- To need the investigative power of LSS i.e. no ‘just do it’ projects

Potential projects then went through a project framing exercise with UCD Agile and our training service provider in which a draft charter was developed, fleshing out the proposed project in LSS terms, and allowing a decision be taken as to its suitability as a green belt project. (A number of potential projects were excluded at this point).

As training started there were four confirmed projects: enhancing staff recruitment in HR; module reading lists in the Library; capturing research outputs in Research; and creating an outputs based research supports scheme in Research. These projects were concluded successfully and the four project leads, after the prescribed assessments, achieved LSS green belt accreditation.

The second pathfinder cycle of five green belt projects began in October 2016 and is due to close in May 2017. The project areas are: enhancing asset register update process (Finance Office); address the issues giving rise to research underspends (Finance Office); streamline the 'approval to build' timeline for curricular change (UCD Registry); standardising the operation of scholarships and prizes (UCD Registry); and streamlining the production of programme flyers (UCD College of Social Sciences and Law). (A sixth project was paused after three months, with the lack of team lead capacity to pursue the project revealing issues with original setup).

## **2.2 Planning Through to Summer 2017**

We used the ‘plan do check act’ approach to the first cycle of projects to shape our insight and understanding in fleshing out our planning through to summer 2017. By May 2016 we finalised the strategic plan for the first 18 months of UCD Agile, including:

- first cycle of projects from March to mid-summer 2016;
- second cycle of projects from October 2016 to April 2017;
- School focused portfolio of projects from January to June 2017;
- the launch of a community of practice model; and
- the Work Smarter Together University-wide event in March 2017 (Work Smarter Together 2017).

An obvious characteristic of the first year’s projects – that they are almost all based in support units – was intentional, aiming at the relative accessibility of the support units and the assumption they would be more project-ready than the University’s schools and colleges. This is clearly limited as the University carries out its two main activities - education and research – through the 36 Schools, so in looking to our second year we developed a body of work with the Heads of School in the late spring and autumn of 2016, focused by the Head of School as uber customer. This ultimately produced a strategic portfolio of projects with the primary objective of reducing the operational effort for Heads of School and their School managers, a proposal brought to the senior management team for their support and, more importantly, as a means of drawing them into the value and practice of LSS.

### 3. Project Examples and Benefits

Successful projects are key to developing a credible in-house story of the value of LSS. Two examples from the first cycle of LSS green belt projects are the streamlining of the staff recruitment process in UCD HR and improving the module reading lists process in the Library.

**Enhancing Recruitment:** UCD currently runs over 1000 staff and research recruitment processes a year. The customer base for this highly visible process is broad - all staff recruits and all hiring managers. There the three main with the recruitment business were: the overall complexity of the business for all parties; the duration of an individual recruitment process; and particular challenges with the contracts creation phase. This business – a collection of substantial sub-processes - was the subject of significant and varied internal criticism. There was a project team of seven, six of whom were from HR. Key tools: voice of the customer (survey, workshops, interviews); critical to quality analysis; data collection and analysis (recruitment is data-rich but had not been built for analysis); process mapping; as is/to be; risk analysis; and control planning. The project, importantly for the profile of LSS and UCD Agile, delivered initial visible wins by mid-summer 2016 - a simplification for assessment boards of the shortlisting and interview processes and the saving of an annualised 500 hours for the recruiting team. The most significant output from the project was the overall analysis and recommendations enabling future projects, some already complete, others planned.

**Module Reading Lists:** With over 4000 active models in the University, the challenge with module reading lists was poor and late engagement with the process by academics, consequent issues for students in being able to access their module's materials in the Library, and issues for Library procurement. Customers for this process are all module coordinators (800+) and Library staff; students are direct beneficiaries. There were ten on the project team, seven from across the Library central and college functions. Key elements: VoC and 'critical to quality', waste analysis, cause and effect analysis, entity relationship diagramming, as is/to be process redesign. The improved process was released successfully: simplified process; more flexible timelines; improved engagement by academics; more efficient response by Library; more effective provision of resources to students; recommendations for future work.

In both projects the use of the LSS methodology (the tools and the collaboration) energised and liberated the operations teams involved and created a much richer and nuanced engagement with their customers across the University. Both projects had high customer visibility and were recognised as success stories by teams, their managers and their customers.

**Engaging Staff:** With the goal of engaging staff, project-triggered training has been a key mechanism though, clearly, training is an input measure rather than an outcomes measure. Training was used to provide skills to those who were directly going to use them on projects, to spread the Lean Six Sigma message, and to take a measure of how support units would work with their staff in this. Over the course of 2016 193 people took training, 52 associated with the first cycle of projects, 85 with the second cycle, and 57 on direct request. Of this 194, 59 took white belt (half day), 96 yellow belt (full day), 13 green belt (six days) and 26 took some form of Lean Champion training (half day). (See the appendices for more details on training).

Another form of staff engagement is directly with the university grass roots which has a good track record of process innovation and development. UCD's Work Smarter Together (WST)

event March 2017 was a celebration of collaboration and creativity across the campus community and attracted 400 colleagues to three plenary session, 10 breakout sessions, a poster exhibition and pre-event workshops. UCD Agile sponsors WST and works with it as a vehicle for growing and supporting staff, creating communities of practice, and developing the grass roots voice in the UCD community.

#### **4. Lessons and Learnings From the First Year**

Many of the lessons learned are common to other HE institutions and in industry and are covered extensively in the literature. Perhaps the interesting perspective here is the challenges we faced in starting up with the decision already taken rather than a start focused on creating the conditions for a successful initiative. Given ours is not a ‘command and control’ environment, starting up has also been a question of seduction and persuasion rather than remote planning and monolithic programme infrastructures. ‘Plan do check act’ helps connect, engage, learn and grow.

In the absence of a broad institutional reflective community, the following is my perspective, sanity checked with some external advisors and a small group of internal critical thinkers.

Lessons at an organisational level:

- While university senior management (the ‘head’) was brought through a decision making process which put in place a LSS process enhancement and culture change programme, engaging with all the issues the literature indicates as important, they did this without its being a ‘heart’ decision for them. This is perhaps the nature of senior management in a large and complex organisation – they delegate the ‘heart’.
- UCD’s strategic plan, and the strategic initiative which gave rise to UCD Agile, provide clear direction but intentionally does not set specific, detailed, concrete targets. As a consequence, there is not a compelling pressure on the University’s various entities to mainstream the agility and effectiveness agenda – this pressure has to be created.
- UCD has been through years of reduced state finances, reduced operational budgets, controlled staffing whilst increasing student numbers, has coped effectively with this and works reasonably well. This does, however, create a kind of ‘management by coping’ style, one not primed to engage with process enhancement and culture change programmes.
- Senior management are not working from a nuanced understanding of the challenges the strategic initiative is intended to address and so do not have the conceptual framework with which to engage with the unfolding initiative.
- UCD Agile was setup as a unit to support others in ensuring their processes are fit for purpose, effective and efficient, and to support the creation of a continuous improvement culture. In effect this means we were setup to raise to consciousness the need which we would then meet.
- The steering committee is an institutional necessity and formality but does not necessarily provide a reflective space in which thinking and learning takes place.
- The silo-based nature of University structures actively works against creating multi-domain projects, identified after the phase one projects. We were not successful in our first attempt at addressing this.
- Moving to a customer focused, value driven, LSS-based continuous improvement culture has highlighted some change inhibitors in management layers.
  - Finding effective motivations for change is challenging: being a good idea is not enough; being told to not enough; seeing a clear need is not enough; and operational ‘pain’ is not enough.

- There are two change-inhibiting inertias: the inertia of success ("if it works you can't change it in case you break it") and the inertia of 'death' ("if you do that we'll all die" where 'die' = 'the worst possible thing that could happen will happen').
- Barriers to LSS in higher education are well recognised (for example Antony, Krishan, Cullen and Kumar, 2012). Another perspective which exposes some of the mechanisms of resistance is Kahneman's work (2012) on how we think and make choices, particularly the emotional biases of the 'endowment effect' (overvaluing what we already have), 'status quo bias' (an emotional preference for maintaining the status quo), and 'loss aversion' (the tendency to attribute more weight to potential losses than potential gains when assessing risk), all related to a deep rooted conservatism about what we feel we have already invested in.
- While it is relatively easy to overcome change barriers in a crisis, how do you structure change when there is no crises and, at a certain level, everything is seen to be 'fine'?

#### Lessons at a hands on level:

- Great energy and enthusiasm in the project teams was released through using the Lean Six Sigma methodology; it had not had a systematic outlet before.
- Training was a positive in itself – the LSS message is empowering, the methodology provides tool-based confidence, the nature of the training was energising. Perhaps most of all, it was seen as an investment in staff by the institution.
- Training was most impactful when tied to project work and taken by people who planned work together on recognised challenges.
- The 'customer' perspective, which can be problematic concept in Higher Education, proved liberating and incisive to project teams (even accountants!)
- Regarding customers, there is a profound distinction between 'focused on' and 'focused by'. Traditionally many systems and processes are focused 'on' the customer, treating the customer as an object. LSS is focused 'by' the customer – the 'effectiveness' perspective.
- Administrative systems are data-rich but data is not always maintained to enable analysis. While the statistical side of LSS can be very useful (Antony, 2011), the raw data may pose challenges. (Hess and Benjamin (2015) flag other opportunities for the Six Sigma side of LSS in higher education).
- Pragmatic expediency is an established driver - it can be easier to deal with a symptom than fix a problem – and can create a resistance to LSS and its desire to determine causes.
- Green belt projects can be an onerous and potentially off-putting entry point in to the LSS space.
- Green belt trainees need a clear and specific project in order to effectively support their learning.
- Sponsors/line managers were not always clearly focused on their role of supporting their green belt project trainees, even where the sponsor/manager had taken Lean Champion training.
- Green belt trainees did not always have the necessary general project experience i.e. they were faced with both learning how to run projects and how to do Lean Six Sigma.

- The support units did not appear to have established management of project pipelines and so asking them to identify potential LSS projects was a challenge for which they were not well prepared.
- Addressing this ‘pipeline’ challenge was one of the goals of the second phase of projects. We were not successful.
- Support units managements did not appear to embrace the strategic initiative's 'agility and effectiveness agenda' as part of their planning.
- There is a risk of projects being treated primarily as training exercises.

### **Beyond the First Year - Practical Implications**

The following highlight five of the areas in 2017 arising from the lessons learned.

#### Focusing support units

- A 'continuous improvement lead' role will be created in support unit managements, giving units a clearer, more measurable focus on continuous improvement, ensuring the mainstreaming of this work. The three strands of this role for a unit are: to ensure project selection mechanisms are in place, to ensure supports for trainees and early day practitioners are in place, and to lead the learning for the unit.
- The continuous improvement leads will be supported as a group by UCD Agile, receive training as Lean Six Sigma champions, and will be used to create part of the reflective space needed from which to draw deeper learning.

#### Creating a reflective learning community

- More work is being done on developing the conceptual framework in which the 'agility and effectiveness' agenda is understood in depth – what the ‘problem’ is and how this ‘solution’ addresses it.
- In part this is through the ‘continuous improvement leads’ above.
- In part this is being done through 2017’s focus on delivering ‘agility and effectiveness’ gains for the Heads of School layer, directly involving the university leadership team in this, creating a learning environment for our senior academics.

#### Lowering the entry barrier to LSS

- The 'yellow belt cluster' project approach is being developed as the primary initiative/project context for Lean Six Sigma skills development. These are short duration, small team projects, with training provided for team members and external mentoring during project delivery.
- We will continue to use green belt project cycles focused on larger enhancement projects and deeper skills development.

#### Improve pre-project preparations

- More focus will be placed on pre-project preparations, including sponsor training, lead selection mechanisms, pre-project workshopping for leads and sponsors.
- In the support units the ‘continuous improvement lead’ will be

#### Broaden support for front line staff

- Work Smarter Together ([worksmartertogether.ucd.ie](http://worksmartertogether.ucd.ie)), with its grass roots origins and focus on celebrating our creativity and collaboration, will be a key element of grass roots culture shifting. WST is sponsored and supported by UCD Agile.

- The Work Smarter Together community of practice (CoP) model is being launched in May 2017 and will be one of the key supports in creating the continuous improvement culture at the front line, building skills, knowledge, networks and recognition. The development of WST CoPs is one of our key ‘learning by doing’ areas for 2017.

## 5. Conclusion

2016 was about using ‘plan do check act’ to start and to learn. The first cycle of LSS projects did as planned – we delivered concrete value in visible and recognisable processes with wide customer bases. We used this to develop UCD’s LSS stories and to enthuse the project areas involved, with positivity rippling out to colleagues aware of the projects even if not involved. The five phase two projects are similarly heading to successful conclusion this May with the same positive patterns visible. Given we chose high profile processes, all clearly in need of enhancement, we created a broad institutional awareness of the work, particularly through the breadth of the voices of the customer processes and customer success measures.

Perhaps most importantly, this ‘plan do check act’ model has been an effective way of driving learning about the institution and the challenges we face in pursuing this agenda – we knew what the ‘head’ had decided but what lay in the ‘heart’ was to be discovered. This approach was deliberate - to begin with developing UCD stories and successes and to learn about our institutions challenges through doing this - and in this, too, we were successful.

We did not begin by developing the sophisticated and subtle project selection mechanisms (Holmes, Jenicke and Hempel, 2105) which will later be relevant but were not at the start for one simple reason – the culture was not ready for it and was not thinking the right thoughts. Hess and Benjamin (2015) discuss the opportunities for LSS in higher education but these are only true in the abstract; unless you have a command and control approach in your institution these are simply hints for where you might pry loose your first projects. While our experience in the start-up year for LSS in UCD would echo many of the challenges in Antony (2015), to truly understand the challenge you are facing in your own institution when you take up a role in which you commit to implement a decision already taken, follow the spirit of the Lean Startup (Ries 2011) and learn through doing.

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## Appendix – Training Arising From Project Cycles

The following two tables give an overview (i) of the catalytic effect of the green belt project cycles in driving training both for team members and their proximate colleagues and (ii) the focus on central support units in the first year with only 10% of training being taken by those in Schools and Colleges.

Agile Phase	Month	Steering Committee Training	Lean Champion	Green Belt	Yellow Belt	White Belt	Grand Total
Phase 1 GB projects	Mar			7			7
	Apr				16	29	45
Total				7	16	29	52
Phase 2 GB projects	Jun		7				7
	Oct			6			6
	Nov				42	30	72
Total			7	6	42	30	85
Direct Request	Feb	12					12
	Sep				12		12
	Oct		7				7
	Dec				25		25
Total		12	7		37		56
Grand Total		12	14	13	95	59	193

Table 1. 2016 green belt projects as the primary drivers of training

Trainee Location	Units Involved	Trainings taken
Large Support Units	7	144
Other Support Units	14	29
College	5	10
School	8	10
Grand Total	34	193

Table 2. 2016 training participation

## Appendix – Training Catalogue

Our catalogue Lean Six Sigma training options provide for creation and support of Lean Six Sigma process enhancement and change programme environment.

### Lean Six Sigma Champion Training – 1 Day

This programme provide participants with the knowledge and know how to implement a Lean Six Sigma programme roll-out successfully and avoid costly implementation errors. It will also provide managers with the skills necessary to Identify, Prioritise and Mentor Lean Six Sigma projects to success.

With the provision of a minimum of 1 day of training for key stakeholders including potential Project Sponsors to provide an understanding of the critical role they will be asked to play in the selection and support of Lean projects delivered in UCD with the support of UCD Agile.

### **Lean Six Sigma Black Belt for Service and Transaction Training – 12 Days**

This 12 day Lean Six Sigma Black Belt for Service & Transaction training programme is aimed at Project Leaders and the members of UCD Agile who are required to take leadership roles in process improvement efforts for UCD Lean projects in 2016.

This course is nationally validated, compliant with ISO 13053-1:2011, and leads to a Diploma in Process Engineering (40 ECTS Credits).

### **Lean Six Sigma Green Belt Training – 6 Days**

This is a 6 day Lean Six Sigma Green Belt training programme aimed at Project Leaders. This programme involves completing 6 training days in the DMAIC methodology, with participants being required to lead an individual Lean Six Sigma project to successful conclusion.

This course is intended for front line problem solving personnel responsible for resolving process problems in day-to-day operations or responsible for leading Continuous Improvement teams. It is also intended for those working with Lean Six Sigma Black Belts on major improvement programmes or looking for breakthrough performance in key business metrics.

This course is nationally validated and successful delegates will receive Certificate in Process Engineering (10 ECTS Credits).

### **Lean Six Sigma Yellow Belt Training – 1 Day**

This is a 1 day Lean Six Sigma Yellow Belt training programme aimed at UCD personnel intending to participate on Lean Six Sigma projects or progressing to Lean Six Sigma Green Belt and Black Belt levels.

This programme involves completing 1 training day which will provide a general introduction to the structured approach to problem solving and practise in using some of the tools and techniques to prepare candidates to participate on Lean Six Sigma project teams.

### **Lean Six Sigma White Belt Training – 0.5 Day**

This is a 0.5 day Lean Six Sigma White Belt training programme which provides participants with an introduction to the overall Lean Six Sigma approach, as well as a high level overview of the key elements of a successful programme.