Lean in Higher Education: emerging themes, issues and countermeasures

Introduction
The Process Improvement Unit at the University of Sheffield has been in operation since May 2012. Our remit was, and continues to be, to support our staff in improving processes through project work, short workshops and training in Lean principles and tools. We have run some 40 projects, 40 workshops and trained over 100 staff. We have also contributed to the Lean community within Higher Education (HE) nationally and internationally. We are recognised in the sector as leading practitioners.

Background
During our four years of operation we have identified a number of common themes which have emerged in our practice of Lean in HE, which seem to us to be sufficiently different to those faced by Lean practitioners in other sectors as to be worth recording for discussion.

Emerging Themes and Issues

Complexity and size
The core businesses of the university, teaching and research, hide a high degree of complexity. Close links between engineering and business, between medicine and the NHS, the management of third party relationships for the maintenance of the university estate, the connection to the local area and region, are a few examples of the university’s breadth of activity. These will be common to many institutions.

Added to this the sheer size of our university, with some 28,000 students and 8,000 staff, makes it one of the largest organisations in the area. Effecting large scale lasting change in this environment is challenging.

Diffuse decision making structures
Higher Education is characterised by a degree of ‘collegiality’ in its decision making processes not typically seen in other sectors. Our experience over many improvement projects is that it is often very difficult to identify the ‘authority’ for any particular process. Where conflicting interests are identified, we have found almost invariably that project sponsors do not assert authority in any meaningful and practical way. This seems to apply regardless of the level of seniority of the sponsor, and indeed is more prevalent the higher up the structure we go.

In one project a decision was referred upward and onward no fewer than four times before being shelved, with the consequence that an improvement which could have saved 184 hours of work could not be implemented. In other examples faculty hierarchies have decided that particular solutions need not apply to them as they are ‘different’ in some unspecified way.

Permeability of decisions
Allied to this lack of authority is a pervading sense that decisions are only ever temporary, and that everyone is more or less free to ignore those with which they disagree or which will cause them difficulties as individuals. Managers seem to have little interest in working on
processes, usually leaving improvement work their staff who work ‘in the process’. We have been involved with several projects where agreements made were later found to have been ignored as a matter of personal preference.

**Little practical senior support for continuous improvement**

As Masaaki Imai says “You can’t do kaizen just once or twice and expect immediate results. You have to be in it for the long haul.” Given the constantly shifting structures and people at the top of any organisation, unwavering support for continuous improvement is unlikely. In the University sector this is perhaps compounded by the diffuse authority structures referred to above. This translates to a sense that continuous improvement is optional and only to be pursued when ‘convenient’ to service providers. Moreover, where senior level staff have been directly involved in projects, they have tended to fight the departmental or functional corner much more strongly than operational staff, and have emphasised political concerns over operational excellence. There is a relationship here with the importance of departmental strategies, and the lack of alignment of these strategies.Crudely put, the estates department’s strategy is to build as many new buildings as possible, the research office’s strategy is to win as many research projects as possible, and the finance department’s strategy is to save as much money as possible. If these are the overriding concerns of each

![Strategy Alignment Diagram](image-url)
Projects are not linked with strategy
The uptake of process improvement initiatives in the University sector appears to have been largely driven (with some notable exceptions) by the need to be seen to be doing something in response to the first Diamond Report of 2011. Certainly in our institution, project selection has been largely a matter of chance, interest and urgency, rather than dictation by the needs of a higher level strategic direction. The result is that local improvement is realised, but consideration of the impact on the overall system, and the potential of Lean to contribute to the realisation of strategic goals, is ignored. Furthermore, tinkering with individual service areas or processes may actually detract from university-wide improvement.

Long-term commitment is poor
Given this background it is not surprising that engagement with process improvement is temporary and intermittent. We have found that ongoing continuous improvement is dependent on individual enthusiasm and understanding rather than on an institutional culture. Lack of continued practical leadership from senior management and the resulting lack of support from middle management, together with the resource limitations which we face in the Process Improvement Unit, mean that improvements gained have tended to slip back after project closure.

Process improvement is only seen as important in the context of financial stringency
With the university in relative financial health, a feeling exists that ‘we’re doing ok’. While it has been relatively easy to engage with and help operational staff struggling with poor processes, we have found that financial savings tend to motivate more senior staff. When cost-cutting becomes a pressing concern for the institution, leaders have sought our help in making improvements to major value streams. The risk here for us, and for sustainability of the Lean programme, is that cost-cutting may bring short-term gains, but almost certainly means that continued engagement with staff will become much more difficult.

Middle management engagement
Improvement projects at the University of Sheffield have tended to have as team members those at the operational end of the organisation, on the principle that it is they who understand how their parts of the process really work. Our observation is that managers may understand how processes ought to work, but equally they may have little understanding that their teams are involved in many University processes, and that good work done by their teams does not necessarily correlate with effective process functioning.
Lack of involvement by management in process improvement leads to poor understanding of its benefits, and on occasion rearguard action to restore existing functional roles.
Middle managers are often caught between the demands of senior University leaders, who create new initiatives which middle management have to carry out. Examples at our own University include the “Languages for All” programme, and the University apprenticeship scheme. Middle Managers of course must turn to their staff for actual implementation, and these staff will invariably do their best with little resource, or will be unable to implement the initiative at all.

Unwillingness to expose errors
Typically teams in our projects are remarkably honest about problems. This may be due to the makeup of our teams, referred to above, or it may be because operational staff see ‘the
blame’ as lying elsewhere. However it is far harder to encourage middle and senior managers to publicise perceived weaknesses, perhaps because they do feel threatened by such exposure, and by their lack of knowledge of problems exposed by their staff.

**Standardisation is an alien concept**

Universities by their very nature encourage ‘difference’ and academic freedom over standardisation and conformity, and as Lean practitioners we recognise that because academics are ‘customers’ of many processes, we must listen to their concerns about managerialism and the real and perceived challenges to academic freedom. However, we find that this suspicion very often overflows into areas where standardisation would be a boon to academics. Multiple interpretations of, for instance, ‘special medical circumstances’ for students lead to many problems for academics, caught between the demands of their students and the need for consistency and fairness. Departments who keep their own spreadsheets of students typically create problems, not only for the administrative services, but for themselves as well, as time is taken up in checking and rechecking differences in the record. Moreover, because of the federal structures previously noted, inefficiencies so produced are largely hidden. At the departmental level, creation of the 41st way to monitor student progress seems a perfectly logical response to the inadequacies of the central student record.

**Obtuse and arcane financial management**

We have observed that financial management within our University often causes problems for process improvement. Budgets aligned to departments and functions are not readily reassigned to value streams, and it is often not possible to gain small amounts for process improvement. Nearly always we are told there is zero budget for projects with which we are involved. On the other hand, large sums are available for departmentally driven software acquisition projects. The yearly budget allocation cycle often leads to spending sprees at the end of the financial year on arbitrary pieces of equipment in order not to lose the budget for the next financial year, which in turn leads to process problems in the use of the equipment.

**Lean work focussed on back office/support processes**

The work of universities is focussed on teaching and research, but most of our work, and as far as we are aware, the work of colleagues in other UK HE institutions using Lean process improvement methods, has been with ‘back office’ processes such as student administration, finance and other support functions (although colleagues in HAN university in the Netherlands have worked on the primary processes related to teaching). It has been difficult to engage academic colleagues, perhaps naturally enough as they regard the administrative top slice of research funds as their payment for someone else to do the work. Our concern is that without a focus on primary processes such as course creation, teaching assessment, research grant capture and so on, improvement to support processes will be improving efficiency but not effectiveness. Evidence for this concern is found in administrative colleagues’ willingness to create endless variations on process to suit the ‘flexibility’ of academic course structures - to the extent, in one example, of producing course regulations which were logically inconsistent.

**Relatively low volume processes/value streams**

Apart from a few obvious examples (invoice payment, reactive maintenance and repair) most University processes are low volume, and may have a high degree of variability. It is
hard to justify expensive staff resource being allocated to improving processes where this is the case, particularly when individual task owners think that the process is working 'well enough'. Only when a crisis occurs, such as peaks in demand for a service, or alteration to service provision, is there impetus for change. Often when this does happen we have observed that once the crisis is past the improvements are dissipated or ignored, and the business returns to the 'status quo ante'. Similarly there is often little appetite for examining variation, which is accepted as an inevitable consequence of the need for flexibility and innovation. More often it is in fact a consequence of the lack of engagement with process.

Examples from The University of Sheffield Academic year 2015/16

<table>
<thead>
<tr>
<th>Process</th>
<th>Volume</th>
<th>Occurrence</th>
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<tbody>
<tr>
<td>Change of Student Status</td>
<td>4,000 p.a.</td>
<td>Peak in September-October, approx. 150 per month Nov-Aug</td>
</tr>
<tr>
<td>Casual Worker payments</td>
<td>10,000 p.a.</td>
<td>850 per month</td>
</tr>
<tr>
<td>Undergraduate Applications</td>
<td>50,000 p.a.</td>
<td>Peaks January and August</td>
</tr>
<tr>
<td>Undergraduate Registration</td>
<td>12,000 p.a.</td>
<td>10,000 in September, 100 per month October-August</td>
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**University Academic Cycle**

Many University processes are naturally dependent on its annual student intake. This means that it is hard to show anything other than trivial 'quick wins' from process improvement efforts. Enthusiasm for changes can be dissipated over the lengthy project cycle, and the inevitable changes in staff, regulation, organisational structures and the like, mean that staff knowledge of, and commitment to, agreed improvements can be lost altogether.

Bob Emiliani “The Lean Professor” (2013)

No straightforward customer/supplier relationship

Who is the customer in a university? Traditional answers would be ‘the student’, or ‘the research grant awarding body’. In reality the student is better thought of as a co-producer, but because of their temporary relationship with the University and their relative naivety in terms of expectations it has proven difficult (at least for us) to engage properly with them. It is easier for us to talk to service providers (who incidentally often see themselves as
customers) and this again carries the risk that we are improving efficiency without addressing effectiveness.

**Ever-changing Government requirements**

All universities face demands from government agencies to provide more statistical information, to comply with increasingly complex regulations, and to meet ever more stringent targets. The introduction of border controls for overseas students alone has increased workload in our student services and computing services departments by some 42% and 11% respectively over the last four years. In this environment of constant uncontrollable change, processes tend to be developed very much in an ad-hoc fashion, adding to checking and rechecking, and requiring constant small changes to supporting computer systems. The production of statistics for HESA is another area where annual changes force the collection of ever more detailed pieces of data about students and courses. In 2015/16 for example, universities were obliged to provide numbers of student in receipt of support, and information about apprenticeships. In this environment it is very difficult for staff to take time to think about continuous improvement, as they know that the environment may well be different within a short time scale.

**Audit Requirements**

Fear of audit, and more often assumptions about audit requirements, are at the root of much reluctance to improve process efficiency. Staff can be aware that processes are inconsistent and illogical, but are loath to change because they cling on to the notion that more checking, more duplication of data, and more authorisations will in some way make them ‘compliant’ with the demands of audit. Auditors encourage this conservatism by telling us what is wrong with current processes but refusing to provide guidance on what might be acceptable.

**The Hawthorne Effect**

As Lean practitioners we are aware of the need for evidencing improvements with quantitative as well as qualitative data. We have insufficient experience of other approaches to continuous improvement, and are therefore open to the charge that any improvements realised by our efforts are the result of the so-called Hawthorne effect, which claims to show that the subjects’ awareness of being observed temporarily changes their behaviour. Certainly we have observed that compliance with new and changed practice can be short-lived, although we tend to ascribe this behaviour to the middle management problem described above.

**Countermeasures**

**Long Term Process**

Given the experience of ‘Lean’ initiatives in other sectors, and our own experience in sustaining improvements, patience and determination are key virtues for the Lean practitioner. In other sectors, short-term change programmes have failed because initial results were disappointing, or leadership changes meant a change of focus, or staff engagement was poor, or a combination of all of these factors. Taichi Ohno acknowledges that it took at least 30 years to improve overall efficiency at Toyota (Toyota Production System, Introduction) Lean requires long term commitment. Ongoing commitment and resilience of the process improvement team, and a willingness to treat setbacks as setbacks rather than disasters, is essential. Training of project team members and others, and the
gradual insertion of process improvement principles into management training initiatives are excellent ways of building a culture of continuous improvement - and it is here where our greatest successes have been seen. To have colleagues approach us some time after a project or attendance at our training sessions, with news of improvements they have undertaken, is for us a valuable measure of our success.

Build long term relationship with VC
The story about Jack Welch of General Electric meeting random people in the organisation and demanding to know what processes they were improving may be apocryphal but it does serve to illustrate that long term support from the top of the organisation is key to success. Unless everyone in the organisation is aware that continuous improvement is part of everyone’s work, progress will come to a halt sooner rather than later. We were fortunate in having the support of our VC from an early stage, but sustained practical input into our work from the VC’s office is hard to achieve. We have found that keeping the VC up-to-date with successes and challenges is key to maintaining his interest, but the risk always exists that future incumbents will take a different approach. Embedding of a continuous improvement culture referred to above is crucial for mitigating this risk. It is far less likely that a new VC will change a culture than a strategy. Furthermore, our initial focus on ‘doing what people want us to do’ was, we think, absolutely the right approach for building understanding and engagement, but it is no longer enough to rely on chance encounters. Alignment between strategy and the value streams which deliver it must be part of university thinking and planning.

Train senior management in Lean thinking
We have found it very difficult to engage our senior management team in a real understanding of Lean methodology. Their interest is largely in increasing efficiency and making savings (not necessarily in staff but certainly in resource usage). We have made repeated suggestions that an overview of Lean would be valuable. However, largely this is seen as something that more junior management should be undertaking. Such reluctance may be something to do with senior management’s sense that they already understand everything(!) or it may be grounded in a fear that others will see that they do not know everything. Of course, Lean as a methodology is predicated on the belief that we do not know everything and that it is everyone’s job to ask. We have tackled this problem by introducing Lean concepts ‘by stealth’ in meetings with senior management, but as yet have no evidence for effectiveness.

Senior management engagement with middle management
As process improvement teams we have more or less influence on middle management: real direction must come from senior management. Embedding training into existing management development programmes as well as ensuring we train staff ourselves is key to spreading knowledge, understanding and most importantly, cultural change. At Sheffield we are making headway with this effort, but slowly (see above).

Focus on major value streams
Doing what is important to the University, rather than what is important to departments or teams, is fundamental to the success of a long term Lean strategy. Recently we have been involved with major HR processes which directly affect the University’s overall ability to engage and retain the best staff. This has raised the profile of the unit, but more importantly
has given impetus to the organisation to think about a complete value stream rather than individual processes.

**Evidence the benefits of standardisation to the academic community**
Providing concrete examples of successes associated with standardisation - course assessment for instance, or exam paper production - will help to engage academics in process improvement efforts. Very often the impact of improvement is felt most obviously in central administrative support services, with departments perhaps feeling that more work is coming their way as a result. Constantly reinforcing the message that the approach is designed for win-win, challenging negative perceptions of improvement methods, and being open to challenge ourselves are all essential parts of this evidence gathering.

**Make sure you have evidence to steer improvement**
Academic staff need to know that the need for improvement is based on sound data, and the need to measure what is important for academia. Evidencing hard financial benefits are important, of at least equal importance is ensuring that staff and student satisfaction remains high and that measuring time savings equates into delivering a better student experience. “In a world where questions on efficiency and effectiveness are increasingly being asked, it is important that the higher education sector demonstrates that it can step up to the plate as much as the NHS and other sectors are doing.” Steve Butcher, foreword “A Guide to Evidencing the Benefits of Business Process Improvement in Higher Education” (2015)

**Keep doing it**
Continuous improvement is fundamental to Lean. Perhaps just as fundamental for Lean practitioners is the determination to keep trying. The peculiarities of the University environment described above make this even more important.

**Conclusion**
The environment in HE is clearly very different in many important respects from that in manufacturing. As a result, although Lean practitioners in HE undoubtedly face many challenges common to Lean practitioners everywhere, they are also confronted with some very specific environment-related issues.
In particular, there is significant tension between the focus on everyday process improvement, often in very discrete areas, which at first sight do not have an impact on the University as a whole, and securing such improvements in an environment which does not regard process improvement as of strategic importance.
Nonetheless, the countermeasures we have suggested adopting to address the problems outlined are not very different to those which might be used in any other sector: in the end it is difficult for Lean to be successful unless it is embedded in the strategy and culture of the organisation, and explicitly led and supported by senior management.

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